
Flight Test Evaluation of the Stanford University/United Airlines Differential GPS Category III Automatic Landing System

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INTRODUCTION

The Federal Aviation Administration (FAA) has established a program to evaluate the technical feasibility of using Differential Global Positioning System (DGPS) based technology for International Civil Aviation Organization (ICAO) Category (CAT) IIIB precision approach and landing applications. This program includes evaluation of DGPS systems developed by independent researchers/contractors onboard test aircraft provided by member airlines of the Air Transport Association.

The overall objective here was to verify that the Stanford University/United Airlines DGPS system demonstrated the capability to meet the requirements for accuracy and integrity, as specified in the FAA CAT III Level 2 Flight Test Plan [2], over at least 91 completed CAT IIIB approach and autolandings.

Specific objectives were:

1. Accuracy: Determine whether the CAT IIIB equipment met 1) FAA AC 20-57A (Automatic Landing Systems) [3], AC 120-28C (Criteria for Approval of CAT III Landing Weather Minima) [4] and the Required Navigation Performance (RNP) for total system error for a straight-in, Instrument Landing System (ILS) like approach for CAT IIIB, and 2) ICAO Annex 10 [5] Microwave Landing System (MLS) accuracy requirements for navigation sensor errors.
2. Integrity Monitor Response: Determine whether the CAT IIIB equipment integrity monitor response had a low alarm rate and detected out of tolerance total system and navigation sensor errors. The CAT IIIB equipment was expected to detect all satellite signal anomalies which did occur. In addition, the CAT IIIB equipment was not expected to generate any false alarms.

The Stanford University/United Airlines system performance was compared to Measures of Success (MOSs) as specified in the FAA CAT III Level 2 Flight Test Plan, where determination of successful performance was based on statistical hypothesis testing. For the Stanford University/United Airlines system to be considered successful, MOSs based on total system error must have successful performance [2]. MOSs based on navigation sensor error were included to acquire additional information on system performance, but the primary interest was in total system error.

ACCURACY AND INTEGRITY REQUIREMENTS

The RNP specifies system accuracy in terms of total system error, as opposed to navigation sensor error as currently specified for ILS. For precision approaches, the RNP describes the required accuracy via two concentric rectangular tunnels that surround the final approach path to the landing runway [1]. Both tunnels are centered around the 3 degree glide path that intercepts the runway 954 ft past the threshold and decrease in lateral and vertical size as the runway intercept point is reached.

The inner tunnel defines a region within which the aircraft's Center of Gravity (CG) must be contained a minimum of 95 percent of the time. Associated with the inner tunnel is a two-dimensional touchdown dispersion box that extends ± 27 ft laterally from the runway

centerline and ± 750 ft longitudinally from the runway intercept point. The aircraft CG must be contained within this box at touchdown a minimum of 95 percent of the time.

The outer tunnel defines a region beyond which no part of the aircraft is allowed to extend with a probability greater than 1 in 10^7 landings.

The navigation sensor error is specified in terms of two parameters: Path Following Error (PFE) and Control Motion Noise (CMN). With regard to MLS, PFE is defined as that portion of the guidance system error which will result in an actual aircraft displacement from the desired flight path [5]. CMN is defined as that portion of the guidance system error which, when coupled to the autopilot, results in control surface, wheel and column motion, and possibly attitude angle change, but does not cause aircraft displacement from the desired flight path [5].

The integrity under normal operating conditions is specified in terms of false alarms, missed alarms and time to alarm. A maximum of one false alarm is allowed and there can be no missed alarms. In addition, any alarm condition must be acknowledged in two seconds or less.

The specific accuracy requirements for MOS 1 through MOS 4 as well as the specific integrity requirements for MOS 6 and MOS 7 are described in detail in the FAA CAT III Level 2 Flight Test Plan.

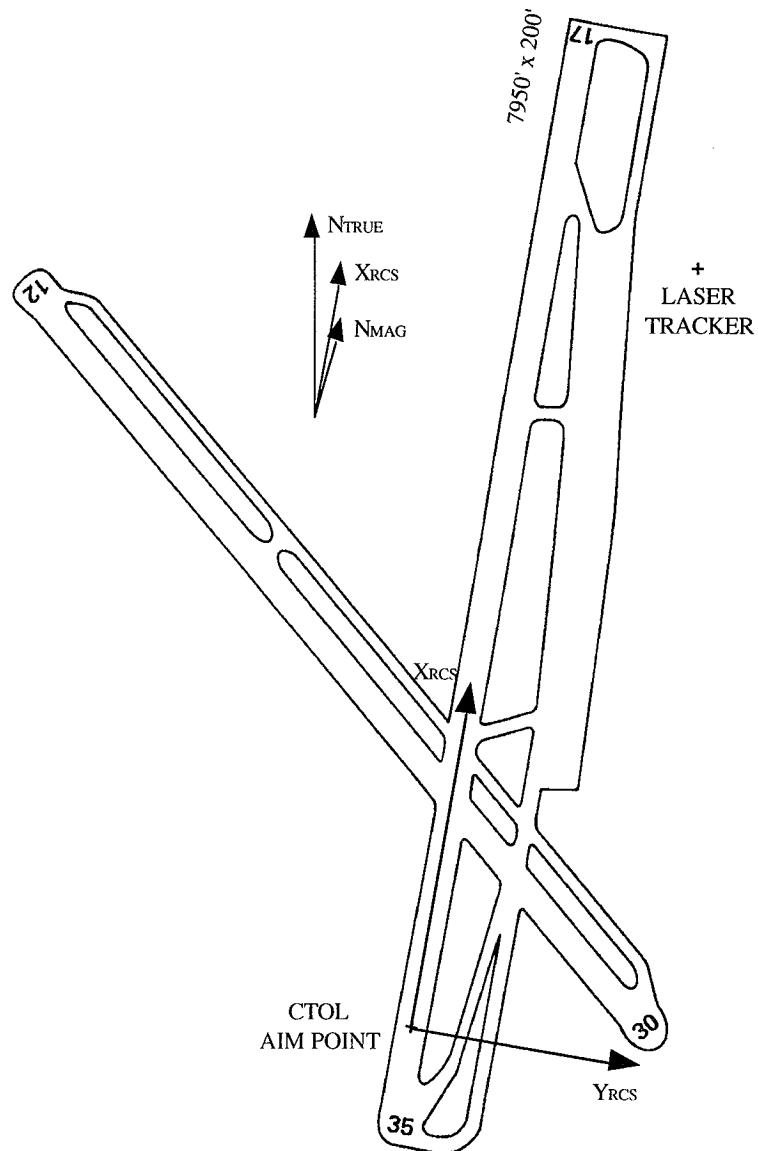
FLIGHT TEST FACILITIES

All test flights were conducted at NASA Ames Research Center's Crows Landing Flight Facility, located in the San Joaquin Valley approximately 45 miles East of the NASA Ames Research Center. The NASA test facility at Crows Landing includes two Nike X-band monopulse radar trackers and one precision NiYag laser tracker. The laser tracker provides precise aircraft range, azimuth and elevation and is used to provide the GPS time-tagged truth reference data by tracking a laser retro-reflector mounted on the test aircraft.

The stated laser tracker range accuracy is nominally ± 1 ft (1σ) out to 30,000 ft; azimuth and elevation accuracy are nominally ± 0.2 mrad (1σ). These values equate to an estimated position error of ± 0.230 m along-track, ± 0.489 m laterally and ± 0.448 m vertically at the 100 ft Height Above Threshold (HAT) position along the 3 degree approach path (2230 m from the laser tracker). However, experience with the laser tracker during this and other approach and landing flight tests has demonstrated accuracies which are consistently better than shown above.

The laser tracker was calibrated immediately prior to the start of the series of approaches during each test flight. In addition, the laser tracker was checked after each approach by tracking a static laser retro-reflector mounted at a survey point located approximately underneath the 100 ft HAT position along the 3 degree approach path (See Figure 1).

In the laser truth reference data post-processing, laser range, azimuth and elevation data were wild-pointed and smoothed with a zero phase-shift, low-pass digital filter. The static laser check data were then used to identify laser range, azimuth and elevation biases as a function of time. The laser truth reference data were corrected for refraction errors, and finally converted to the rectangular Runway Coordinate System (RCS).



LASER CALIBRATION
CHECK POINT +

Figure 1 Crows Landing Flight Facility

Figure 2 shows a laser truth reference position error of ± 0.061 m (1σ) laterally and ± 0.084 m (1σ) vertically at the static laser retro-reflector position (2420 m from the laser tracker) for a five minute laser track of the static laser retro-reflector on the last day of the flight test. This data is the result of the above mentioned post-processing steps and is characteristic of static laser checks of this and other approach and landing flight tests conducted at Crows Landing.

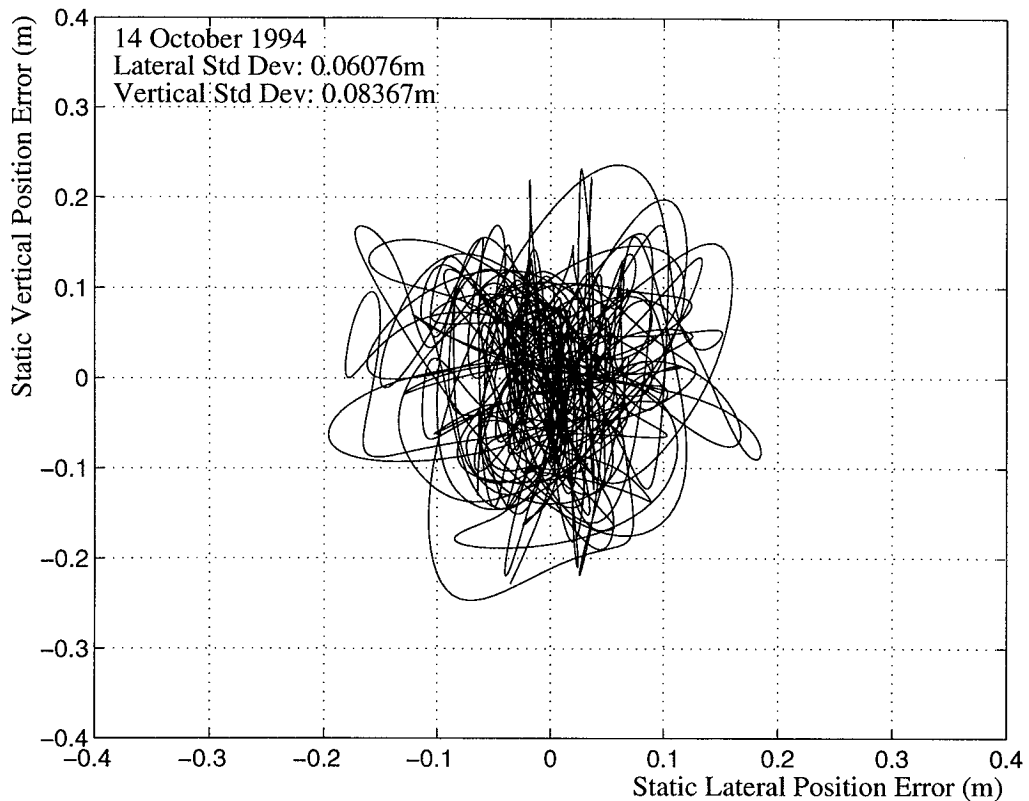


Figure 2 Smoothed And Bias Corrected
 Static Laser Tracker Calibration Check Position Error
 CTOL Laser Calibration Check Target (Range: 2420 Meters)

FLIGHT TEST DESCRIPTION

The flight test consisted of standard 3 degree glide path straight-in approaches terminating with autolandings to Runway 35 at the Crows Landing Flight Facility (See Figure 3). Each approach was started at the Initial Approach Fix (IAF) located five nautical miles out along the runway centerline with the test aircraft established on speed, on course, on glide path, configured for autolandings with all data collection equipment operational.

Laser tracking data were recorded from the time the test aircraft crossed the Final Approach Fix (FAF), located three and a quarter nautical miles out along the runway centerline, through autolandings and the subsequent touch and go or landing roll-out. At the completion of the touch and go, the test aircraft was flown back to the IAF (via the test pattern depicted in Figure 4), to set up for another approach. Ten percent of the autolandings terminated with a full stop, followed immediately with a takeoff to set up for another approach.

All of the approach and landings, from the FAF to touchdown, were accomplished with the guidance coupled to the autopilot. Upon touchdown, the autopilot was disengaged,

and the pilot assumed control of the aircraft. All test flights were flown in day Visual Meteorological Conditions (VMC).

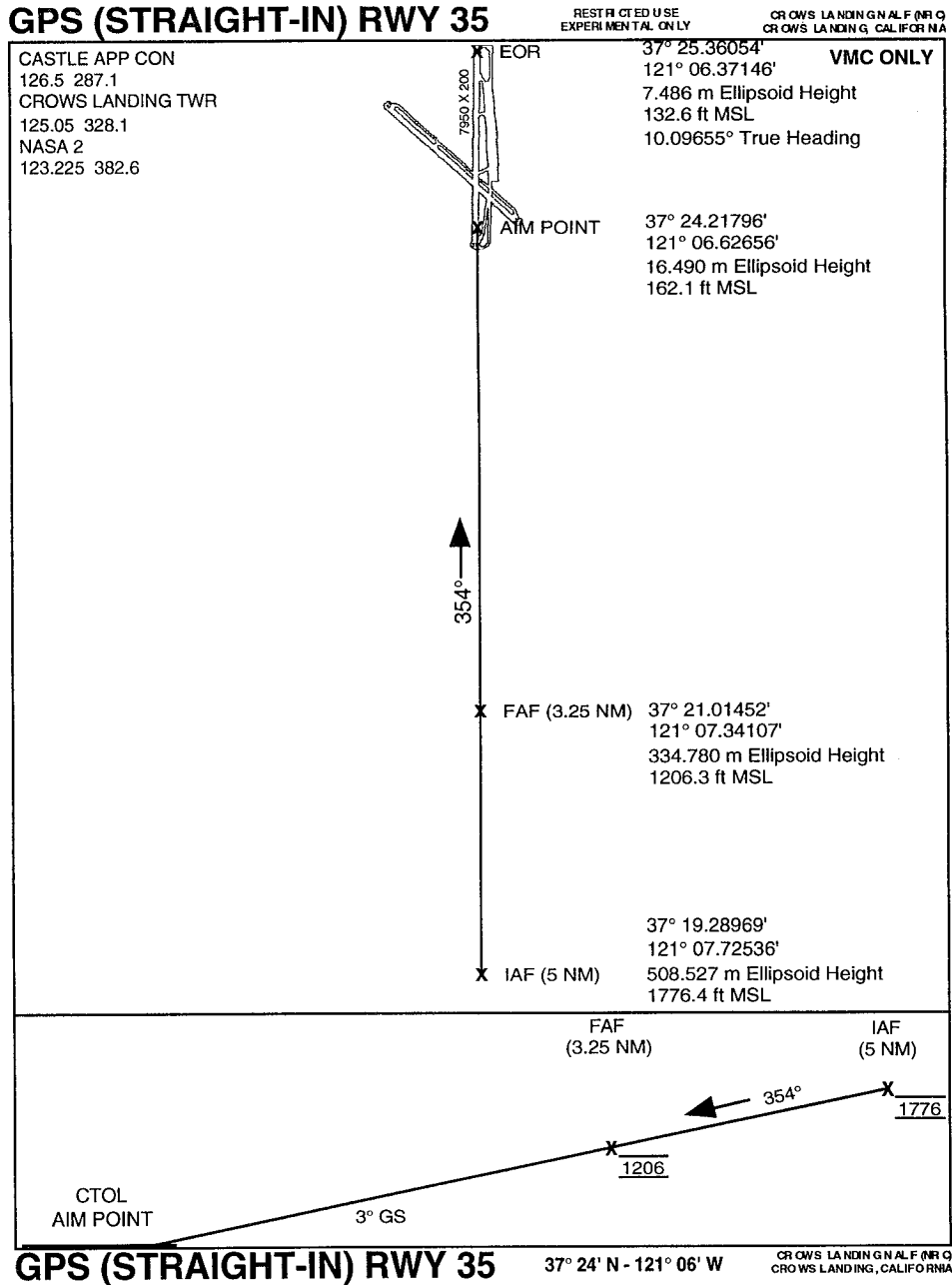


Figure 3 Crows Landing Flight Facility Runway 35 Approach

After the test aircraft initiated the touch and go or takeoff, the laser tracker was used to track the static laser retro-reflector, located on the runway centerline approximately 1600 ft prior to the Runway 35 Threshold (See Figure 1), to perform the laser tracker calibration check as discussed in the previous section. At the completion of the laser

track of the static laser retro-reflector, the laser tracker re-acquired the test aircraft on its turn from base to final.

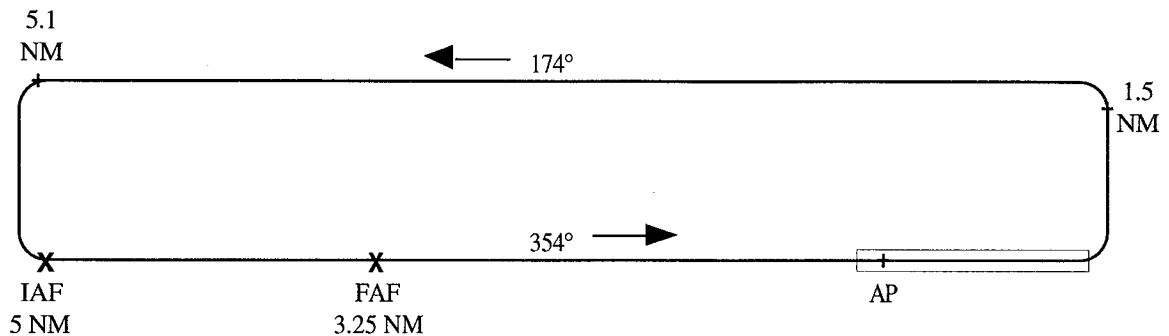


Figure 4 Crows Landing Flight Facility Runway 35 Flight Test Pattern

FLIGHT TEST RESULTS

All of the 100 approaches and autolandings evaluated were accomplished at the Crows Landing Flight Facility between 11 and 14 October 1994. Using the laser tracker as ground truth reference, both total system error and navigation sensor error were measured and evaluated for all of the approaches and autolandings. For the Stanford University/United Airlines system to be considered successful, MOSs based on total system error must achieve successful performance. MOSs based on navigation sensor error were included to acquire additional information on system performance, but the primary interest was in total system error. Refer to the FAA CAT III Level 2 Flight Test Plan for a complete discussion of the individual MOSs as well as the data processing procedures for each of the different MOSs.

Vertical Navigation Sensor Error

Evaluation of the vertical navigation sensor error, MOS 1, was based on passing the difference between the laser tracker truth reference and the vertical navigation sensor error (both referenced to the navigation reference point (NRP)) through the vertical PFE and CMN ICAO Annex 10 filters for MLS evaluation. The vertical PFE and CMN filter outputs were compared to the 95 percent thresholds from the 700 ft HAT position to the 50 ft HAT position. Estimation statistics were evaluated on the ensemble data from the 1000 ft HAT position through autoland and the subsequent touch and go or landing roll-out to further characterize the flight test results. Refer to Appendix B for all MOS 1 statistics and plots as required by the FAA CAT III Level 2 Flight Test Plan.

Of the 100 approaches and autolandings evaluated, 50 failed MOS 1 specifications, resulting in the failure of MOS 1. All of the approaches that failed MOS 1 did so by exceeding the vertical PFE filter limits prior to reaching approximately the 500 ft HAT position. This position coincides with the position where the transition from the less accurate code-based solution to the more accurate kinematic solution occurs. In addition, these transitions created relatively large vertical position discontinuities in several of the

50 approaches that failed MOS 1, which in turn resulted in CMN filter spikes that exceeded the vertical CMN filter limits.

Lateral Navigation Sensor Error

Evaluation of the lateral navigation sensor error, MOS 2, was based on passing the difference between the laser tracker truth reference and the lateral navigation sensor error (both referenced to the NRP) through the lateral PFE and CMN ICAO Annex 10 filters for MLS evaluation. The lateral PFE and CMN filter outputs were compared to the 95 percent thresholds from the 200 ft HAT position through autoland and the subsequent touch and go or landing roll-out. Estimation statistics were evaluated on the ensemble data from the 1000 ft HAT position through autoland and the subsequent touch and go or landing roll-out to further characterize the flight test results. Refer to Appendix B for all MOS 2 statistics and plots as required by the FAA CAT III Level 2 Flight Test Plan.

All 100 of the approaches and autolandings passed MOS 2 specifications, resulting in the success of MOS 2.

Vertical Total System Error

Evaluation of the vertical total system error, MOS 3, was based on the difference between the test aircraft NRP vertical position, as determined by the laser tracker, and the vertical position the NRP should have been at on the desired flight path. The total system vertical error was evaluated relative to the inner RNP vertical tunnel limits from the 700 ft HAT position to the 50 ft HAT position. Estimation statistics were evaluated on the ensemble data from the 1000 ft HAT position through autoland and the subsequent touch and go or landing roll-out to further characterize the flight test results. Refer to Appendix A for all MOS 3 statistics and plots as required by the FAA CAT III Level 2 Flight Test Plan.

Of the 100 approaches and autolandings evaluated, only two failed MOS 3 specifications, resulting in the success of MOS 3. The two approaches that failed MOS 3 did so by exceeding the lower inner RNP vertical tunnel limits prior to reaching approximately the 500 ft HAT position. Again, this position coincides with the position where the transition from the less accurate code-based solution to the more accurate kinematic solution occurs. The relatively large vertical position discontinuity at this transition point combined with the slow autopilot response resulted in an over-shoot of the desired glide path and subsequent penetration of the upper inner RNP vertical tunnel limits prior to settling down on the desired glide path.

It is interesting to note that the two approaches that failed MOS 3 occurred on two different days separated exactly by 23 hours and 56 minutes. In other words, it appears that the test aircraft was in the same position in space, with the same satellite geometry for both of the approaches. Both the Horizontal Dilution of Precision (HDOP) and Vertical Dilution of Precision (VDOP) values, as well as the number of satellites, were the same for both of the approaches. In addition, the error trajectory plots for each of the two approaches were very similar.

Lateral Total System Error

Evaluation of the lateral total system error, MOS 4, was based on the difference between the test aircraft NRP lateral position, as determined by the laser tracker, and the lateral position the NRP should have been at on the desired flight path. The total system lateral error was evaluated relative to the inner RNP lateral tunnel limits from the 200 ft HAT position through autoland and the subsequent touch and go or landing roll-out.

Estimation statistics were evaluated on the ensemble data from the 1000 ft HAT position through autolandings and the subsequent touch and go or landing roll-out to further characterize the flight test results. Refer to Appendix A for all MOS 4 statistics and plots as required by the FAA CAT III Level 2 Flight Test Plan.

All 100 of the approaches and autolandings passed MOS 4 specifications, resulting in the success of MOS 4.

Touchdown Dispersion

Evaluation of the touchdown dispersion, MOS 5, was based on longitudinal and lateral total system error at the touchdown point. The total system longitudinal error was evaluated relative to the 1500 ft long touchdown dispersion box while the total system lateral error was evaluated relative to the inner RNP lateral tunnel limits. Estimation statistics were evaluated on the ensemble data from touchdown through the subsequent touch and go or landing roll-out to further characterize the flight test results. Refer to Appendix A for all MOS 5 statistics and plots as required by the FAA CAT III Level 2 Flight Test Plan.

All 100 of the approaches and autolandings passed MOS 5 specifications, resulting in the success of MOS 5. All of the touchdowns were accomplished with the outboard landing gear position less than 145 ft away from the runway centerline.

Integrity Under Normal Operation

Evaluation of the integrity under normal operation, MOS 6, was based on determining the number of missed alarms and false alarms along an approach as well as the time to alarm. For the total system error evaluation, the total system error was compared to the outer RNP tunnel boundary minus the approximate dimensions of a Boeing 747 aircraft. For the navigation sensor error evaluation, the navigation sensor error was compared to ILS CAT III monitor limits for position errors. The true alarm state was determined by the ground truth reference provided by the laser tracker. Estimation statistics were not evaluated due to the fact that few or no alarms were expected.

All 100 of the approaches and autolandings passed MOS 6 specifications, using both the navigation sensor error analysis as well as the total system error analysis, resulting in the success of MOS 6. There were no integrity alarms during any of the 100 approaches and autolandings evaluated. In addition, there were no vertical or lateral missed or false alarms.

Integrity Under Artificial Alarm Limits

Evaluation of the integrity under artificial alarm limits, MOS 7, was not accomplished on the Stanford University/United Airlines system.

SUMMARY OF RESULTS

Refer to Table 1 for a summary of all of the requirements compared to the actual performance, as well as a Pass or Fail score for each of the MOSs evaluated.

Table 1 Summary of Performance vs. MOS

MOS #	Description	Performance	Req'd	Pass/Fail
1	Vertical Navigation Sensor Error: PFE and CMN	50 successful/100	91/100	Fail
2	Lateral Navigation Sensor Error: PFE and CMN	100 successful/100	91/100	Pass
3	Vertical Total System Error	98 successful/100	91/100	Pass
4	Lateral Total System Error	100 successful/100	91/100	Pass
5	Touchdown Dispersion:			
	Lateral and Longitudinal Touchdown Dispersion Outboard Landing Gear < 145 ft From Centerline	100 successful/100 0	91/100 ≤1	Pass Pass
6	Integrity Under Normal Operation			
	Vertical:			
	Time-To-Alarm Always ≤2 Seconds	Yes	Yes	Pass
	Number of Missed Alarms	0	0	Pass
	Lateral:			
	Time-To-Alarm Always ≤2 Seconds	Yes	Yes	Pass
Number of Missed Alarms	0	0	Pass	
Number of Vertical and Lateral False Alarms	0	≤1	Pass	
7	Integrity Under Artificial Alarm Limits			
	Vertical:			
	Time-To-Alarm Always ≤2 Seconds	N/A	Yes	N/A
	Number of Missed Alarms	N/A	0	N/A
	Number of Alarms Per Minute	N/A	~1	N/A
	Lateral:			
	Time-To-Alarm Always ≤2 Seconds	N/A	Yes	N/A
	Number of Missed Alarms	N/A	0	N/A
Number of Alarms Per Minute	N/A	~1	N/A	
Number of Vertical and Lateral False Alarms	N/A	≤1	N/A	

Refer to Appendix A for the total system error, and to Appendix B for the navigation sensor error estimation statistics as well as all ensemble plots specified in the FAA CAT III Level 2 Flight Test Plan. Appendix C contains the individual approach and autolandings data and corresponding plots for each of the 100 approaches and autolandings.

CONCLUSIONS

The Stanford University/United Airlines system met the requirements for a successful approach and autolandings, based on the total system error requirements, 98 out of 100 approaches and autolandings, thereby satisfying all of the total system error MOSs. Based on navigation sensor error, 50 out of 100 approaches and autolandings failed MOS 1 specifications, however, the remaining navigation sensor error MOS specifications were satisfied.

All of the unsuccessful approaches were due to the relatively inaccurate code-based solution. Once the transition to a kinematic solution occurred, the remainder of the

approach and subsequent autolandings were within the limits specified by all of the MOSs. Had this transition occurred prior to the 850 ft HAT position, where the vertical analysis began, all 100 approaches would have been successful, for both the total system error evaluation as well as the navigation sensor error evaluation.

LIST OF REFERENCES

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"Required Navigation Performance (RNP) for Precision Approach and Landing with GNSS Application"
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The MITRE Corporation, May 1994
3. Federal Aviation Administration
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4. Federal Aviation Administration
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AC 120-28C, 3 September 1984
5. International Civil Aviation Organization
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Annex 10, Convention on International Civil Aviation, Volume 1, April 1985

APPENDIX A

TOTAL SYSTEM ERROR RESULTS

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 VRT TOTAL SYSTEM ACCURACY PERFORMANCE FOR MOS 3

SUCCESSFUL APPROACHES: 98
 VALID APPROACHES: 100

\$\$\$\$\$\$\$\$\$\$\$\$
 \$ PASS MOS 3 \$
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 VRT TOTAL SYSTEM ACCURACY ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	16.633	14.884	17.974	122.987
900FT HAT	16.111	14.502	16.115	125.104
800FT HAT	16.003	14.507	14.423	129.567
700FT HAT	15.870	14.406	15.837	128.437
600FT HAT	15.523	14.035	15.808	120.000
500FT HAT	13.465	12.171	14.556	90.149
400FT HAT	6.893	6.221	6.212	23.367
300FT HAT	8.962	8.030	9.866	36.790
200FT HAT	3.083	2.760	2.751	3.937
100FT HAT	2.405	2.224	2.214	3.199
50FT HAT	2.180	2.065	1.931	2.829

 VERT TOTAL SYSTEM ACCURACY ESTIMATION MEAN (m)

LOCATION	VFTE	VSE	VTSE	VTSEEstimate
1000FT HAT	3.132	-2.476	3.132	0.657
900FT HAT	2.494	-2.201	2.494	0.293
800FT HAT	2.146	-2.143	2.146	0.003
700FT HAT	2.073	-2.218	2.073	-0.145
600FT HAT	2.187	-2.244	2.187	-0.056
500FT HAT	1.906	0.430	1.906	2.336
400FT HAT	-1.008	0.415	-1.008	-0.593
300FT HAT	-1.578	0.217	-1.578	-1.361
200FT HAT	-0.667	0.193	-0.667	-0.475
100FT HAT	-0.227	0.152	-0.227	-0.075
50FT HAT	-0.132	0.066	-0.132	-0.066

 VERT TOT SYS ACC ESTIMATE ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	8.348	7.802	6.872	39.912
900FT HAT	5.421	5.162	3.790	17.746
800FT HAT	3.105	3.102	3.233	6.492
700FT HAT	3.074	2.944	2.843	5.791
600FT HAT	2.307	2.253	2.356	3.417
500FT HAT	13.734	12.319	15.081	87.660
400FT HAT	6.311	5.840	5.609	22.063
300FT HAT	8.686	7.814	9.674	36.199
200FT HAT	2.857	2.564	2.643	3.829
100FT HAT	2.257	2.187	2.140	3.213
50FT HAT	2.114	2.052	1.918	2.830

 VRT TOTAL SYSTEM ACCURACY ESTIMATION STD DEV(m)

LOCATION	VFTE	VSE	VTSE	VTSEEstimate
1000FT HAT	6.750	6.686	6.750	3.846
900FT HAT	6.808	6.612	6.808	2.564
800FT HAT	6.929	6.557	6.929	1.551
700FT HAT	6.898	6.523	6.898	1.465
600FT HAT	6.668	6.453	6.668	1.125
500FT HAT	5.779	1.096	5.779	5.699
400FT HAT	2.942	0.199	2.942	2.859
300FT HAT	3.692	0.151	3.692	3.662
200FT HAT	1.208	0.116	1.208	1.191
100FT HAT	1.089	0.096	1.089	1.091
50FT HAT	1.024	0.085	1.024	1.024

LAT TOTAL SYSTEM ACCURACY PERFORMANCE FOR MOS 4

SUCCESSFUL APPROACHES: 100
VALID APPROACHES: 100

\$\$\$\$\$\$\$\$\$\$\$\$
\$ PASS MOS 4 \$
\$\$\$\$\$\$\$\$\$\$\$\$

LAT TOTAL SYSTEM ACCURACY ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	20.763	20.188	19.464	273.977
900FT HAT	18.558	17.716	17.846	209.361
800FT HAT	15.381	14.430	15.372	137.061
700FT HAT	12.173	11.299	11.302	82.979
600FT HAT	10.304	9.351	8.701	54.070
500FT HAT	7.339	6.746	7.620	29.091
400FT HAT	5.688	5.285	5.120	18.177
300FT HAT	6.347	5.878	6.095	22.389
200FT HAT	5.127	4.930	5.147	16.271
100FT HAT	4.481	4.350	4.098	12.714
50FT HAT	4.097	4.093	3.966	11.305
AIM POINT	3.683	3.637	3.301	8.920
AP+0.05NM	3.777	3.645	3.391	8.907
AP+0.10NM	3.844	3.669	3.602	8.982
AP+0.15NM	3.952	3.775	4.127	9.513
AP+0.20NM	4.175	3.985	4.308	10.596
AP+0.25NM	4.504	4.235	4.235	11.833
AP+0.30NM	4.050	3.987	4.045	10.715
AP+0.35NM	4.044	3.756	3.725	9.177
AP+0.40NM	3.821	3.449	3.562	7.191
AP+0.45NM	3.468	3.106	3.138	5.479
AP+0.50NM	3.206	2.870	2.850	4.677
AP+0.55NM	2.129	1.964	1.272	25.358

LAT TOT SYS ACC ESTIMATE ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	19.424	19.222	18.046	249.190
900FT HAT	16.967	16.679	17.092	187.471
800FT HAT	13.742	13.164	14.876	115.819
700FT HAT	10.547	9.963	10.158	65.735
600FT HAT	8.339	7.612	7.686	36.472
500FT HAT	7.299	6.668	7.439	28.039
400FT HAT	5.580	5.187	5.111	17.527
300FT HAT	6.216	5.790	5.919	21.894
200FT HAT	5.141	4.892	4.973	15.933
100FT HAT	4.594	4.348	4.091	12.538
50FT HAT	4.227	4.057	3.892	11.009
AIM POINT	3.714	3.593	3.143	8.666
AP+0.05NM	3.603	3.580	3.441	8.644
AP+0.10NM	3.667	3.629	3.610	8.884
AP+0.15NM	3.826	3.761	4.058	9.535
AP+0.20NM	4.069	3.984	4.280	10.688
AP+0.25NM	4.129	4.095	4.228	11.314
AP+0.30NM	4.140	3.988	4.092	10.658
AP+0.35NM	4.130	3.794	3.691	9.190
AP+0.40NM	3.871	3.478	3.585	7.114
AP+0.45NM	3.525	3.154	3.208	5.477
AP+0.50NM	3.289	2.942	2.960	4.691
AP+0.55NM	2.293	2.058	1.358	25.151

LAT TOTAL SYSTEM ACCURACY ESTIMATION MEAN (m)

LOCATION	LFTE	LSE	LTSE	LTSEestimate
1000FT HAT	-0.613	0.819	-0.613	0.206
900FT HAT	-0.944	0.645	-0.944	-0.298
800FT HAT	-1.129	0.489	-1.129	-0.640
700FT HAT	-1.083	0.406	-1.083	-0.677
600FT HAT	-1.352	0.366	-1.352	-0.987
500FT HAT	-0.773	-0.080	-0.773	-0.853
400FT HAT	-0.497	0.014	-0.497	-0.483
300FT HAT	-0.586	0.066	-0.586	-0.520
200FT HAT	-0.217	-0.065	-0.217	-0.282
100FT HAT	-0.140	-0.143	-0.140	-0.284
50FT HAT	-0.004	-0.184	-0.004	-0.188
AIM POINT	0.047	-0.177	0.047	-0.130
AP+0.05NM	0.144	-0.167	0.144	-0.023
AP+0.10NM	0.195	-0.156	0.195	0.039
AP+0.15NM	0.197	-0.130	0.197	0.067
AP+0.20NM	0.212	-0.123	0.212	0.089
AP+0.25NM	0.316	-0.282	0.316	0.034
AP+0.30NM	-0.065	-0.101	-0.065	-0.166
AP+0.35NM	-0.356	-0.083	-0.356	-0.439
AP+0.40NM	-0.557	-0.067	-0.557	-0.624
AP+0.45NM	-0.620	-0.058	-0.620	-0.678
AP+0.50NM	-0.584	-0.079	-0.584	-0.663
AP+0.55NM	-0.212	-0.172	-0.212	-0.384

LAT TOTAL SYSTEM ACCURACY ESTIMATION STD DEV(m)

LOCATION	LFTE	LSE	LTSE	LTSEestimate
1000FT HAT	10.075	2.308	10.075	9.609
900FT HAT	8.807	2.102	8.807	8.334
800FT HAT	7.126	2.075	7.126	6.551
700FT HAT	5.545	1.954	5.545	4.935
600FT HAT	4.476	1.910	4.476	3.676
500FT HAT	3.283	0.317	3.283	3.223
400FT HAT	2.595	0.223	2.595	2.548
300FT HAT	2.880	0.152	2.880	2.848
200FT HAT	2.455	0.110	2.455	2.430
100FT HAT	2.170	0.111	2.170	2.155
50FT HAT	2.047	0.126	2.047	2.020
AIM POINT	1.818	0.143	1.818	1.792
AP+0.05NM	1.817	0.153	1.817	1.790
AP+0.10NM	1.824	0.146	1.824	1.814
AP+0.15NM	1.877	0.126	1.877	1.880
AP+0.20NM	1.981	0.149	1.981	1.990
AP+0.25NM	2.094	0.391	2.094	2.047
AP+0.30NM	1.992	0.328	1.992	1.987
AP+0.35NM	1.844	0.147	1.844	1.845
AP+0.40NM	1.632	0.107	1.632	1.624
AP+0.45NM	1.424	0.092	1.424	1.423
AP+0.50NM	1.311	0.059	1.311	1.313
AP+0.55NM	0.959	0.107	0.959	0.955

 * TOUCHDOWN DISPERSION PERFORMANCE FOR MOS 5 *

SUCCESSFUL TOUCHDOWNS: 100
 VALID TOUCHDOWNS: 100

MAIN LANDING GEAR LESS THAN 145 FT FROM CL
 TOUCHDOWN AT LEAST 200 FT PAST THRESHOLD

\$\$\$\$\$\$\$\$\$\$\$\$
 \$ PASS MOS 5 \$
 \$\$\$\$\$\$\$\$\$\$\$\$

 * ROLL-OUT CONTROL LTSE ESTIMATION STATISTICS *

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
TOUCHDOWN	4.434	4.010	3.652	9.797
TD+0.05NM	4.422	3.991	4.203	9.623
TD+0.10NM	4.594	4.143	4.512	10.318
TD+0.15NM	4.696	4.279	4.451	11.468
TD+0.20NM	4.501	4.288	4.291	12.254
TD+0.25NM	3.915	3.781	3.888	9.590
TD+0.30NM	3.750	3.461	3.814	7.719
TD+0.35NM	3.251	2.954	3.162	5.434
TD+0.40NM	2.771	2.546	2.421	4.255
TD+0.45NM	2.277	2.156	2.273	3.605
TD+0.50NM	1.716	1.608	1.142	17.365

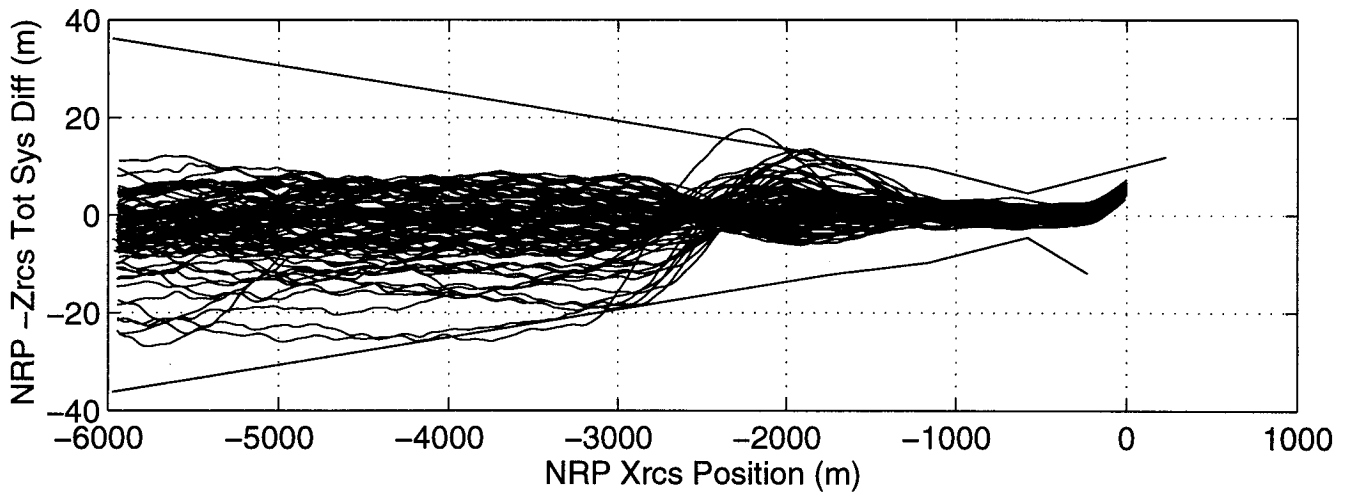
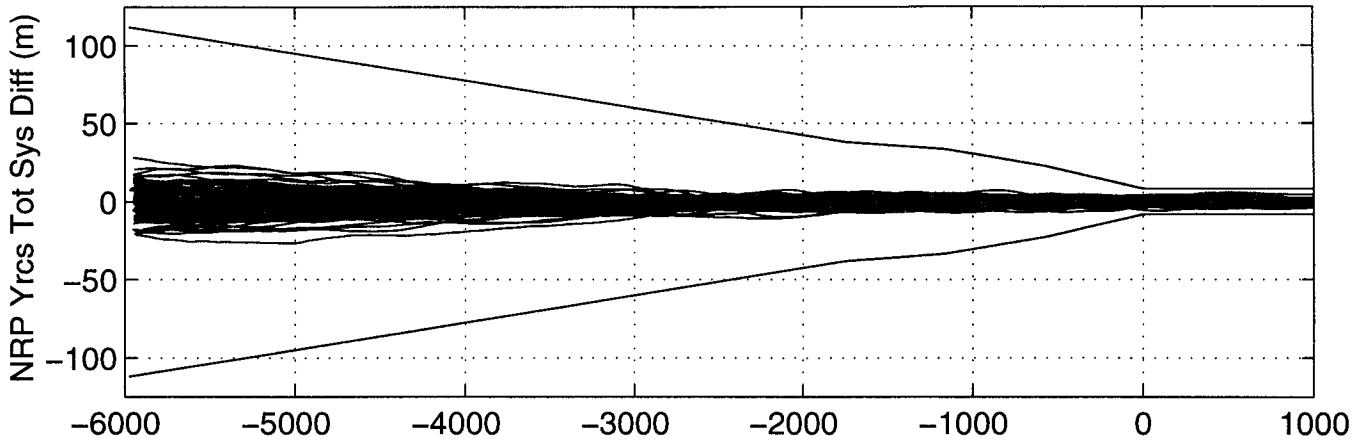
* LAT AND VRT INTEGRITY PERFORMANCE FOR MOS 6 *

VERTICAL TIME TO ALARM 2 SECONDS OR LESS
NUMBER OF MISSED VERTICAL ALARMS: 0
NUMBER OF FALSE VERTICAL ALARMS: 0

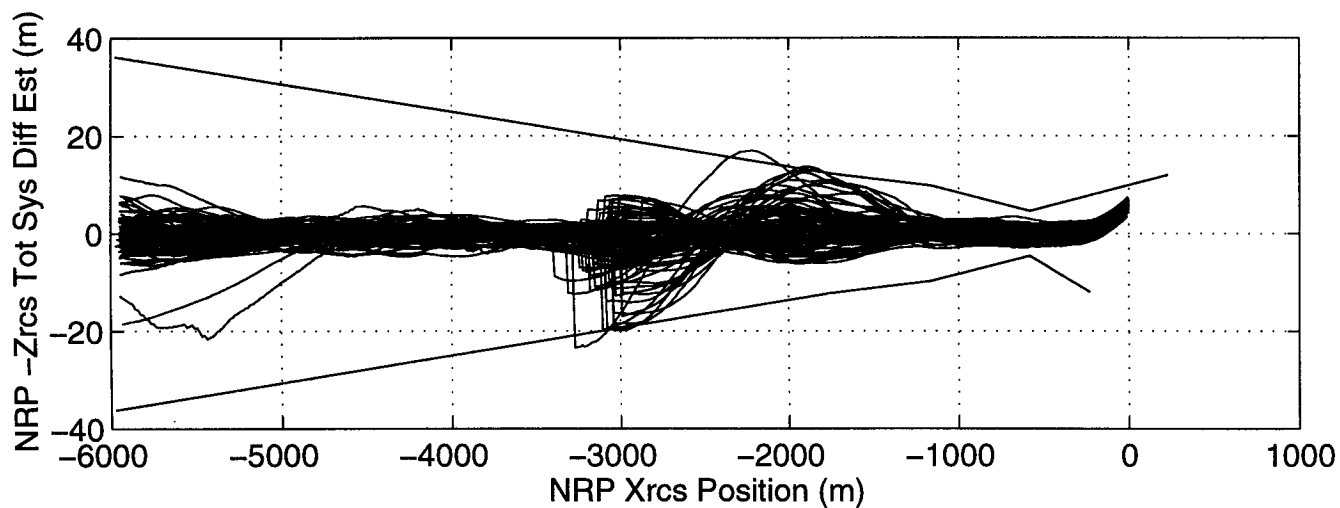
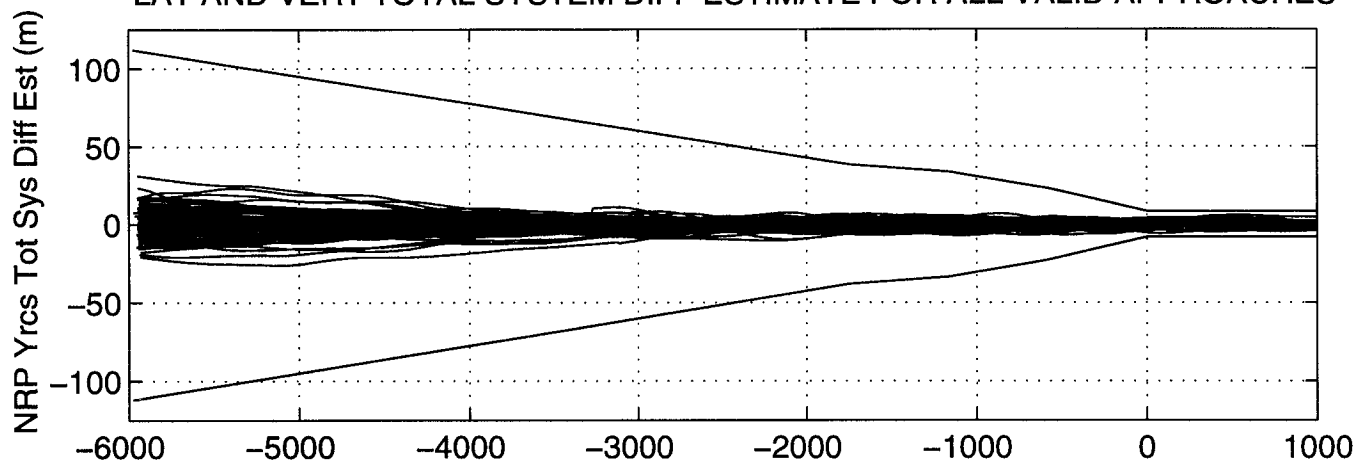
LATERAL TIME TO ALARM 2 SECONDS OR LESS
NUMBER OF MISSED LATERAL ALARMS: 0
NUMBER OF FALSE LATERAL ALARMS: 0

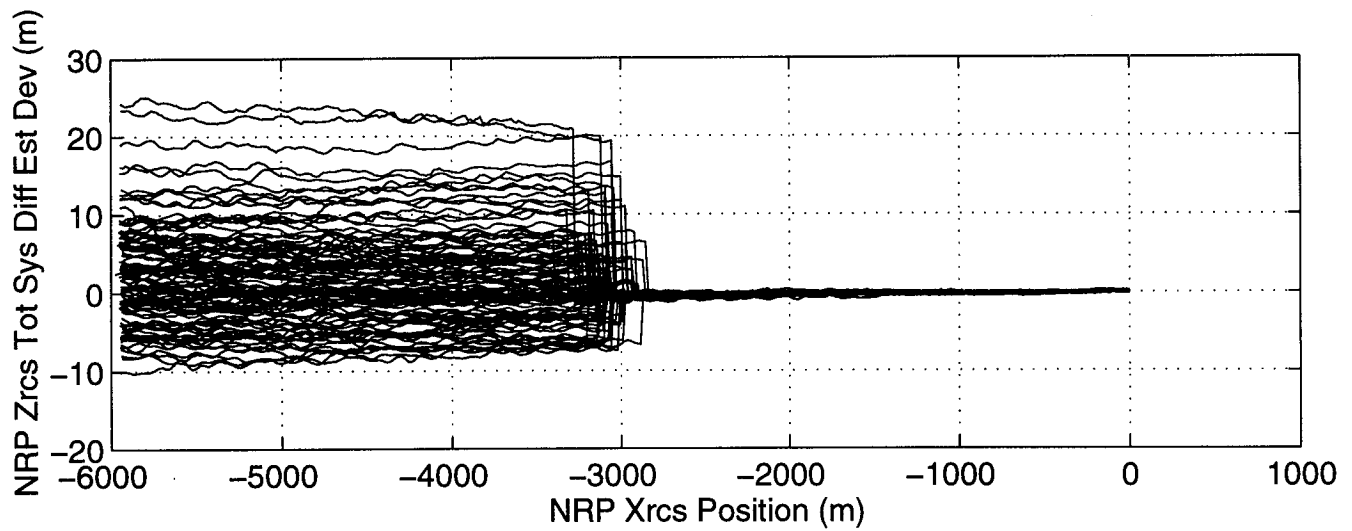
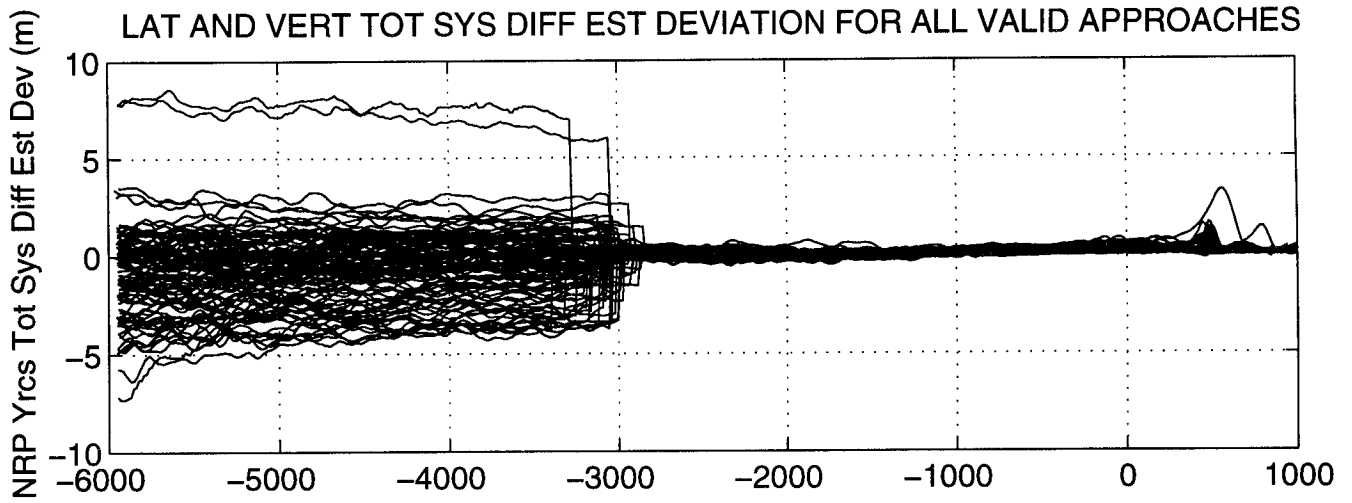
\$\$\$\$\$\$\$\$\$\$\$\$
\$ PASS MOS 6 \$
\$\$\$\$\$\$\$\$\$\$\$\$

LATERAL AND VERTICAL TOTAL SYSTEM DIFF FOR ALL VALID APPROACHES

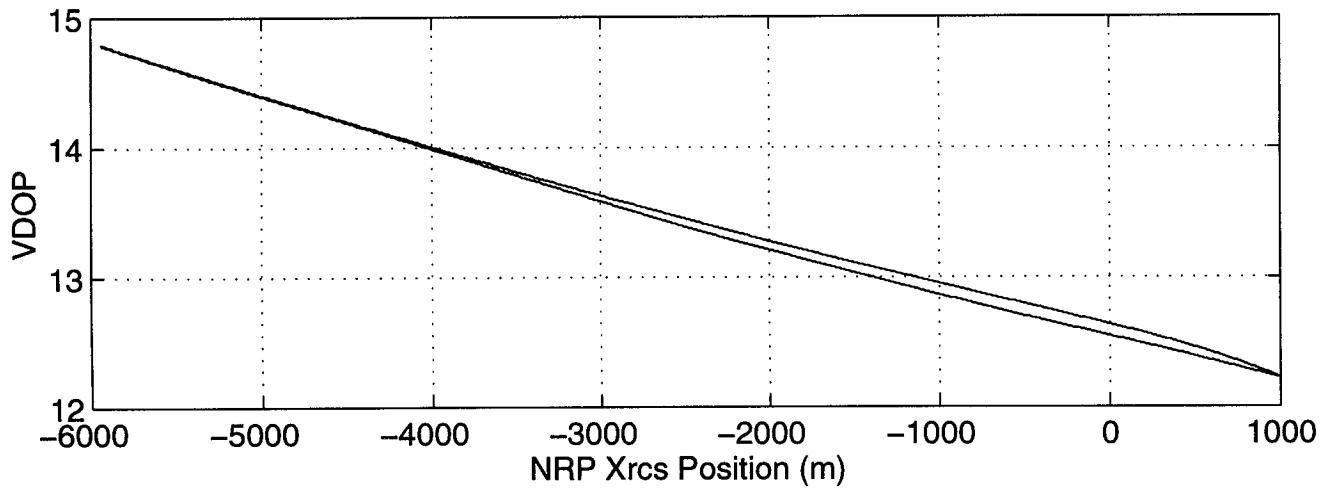
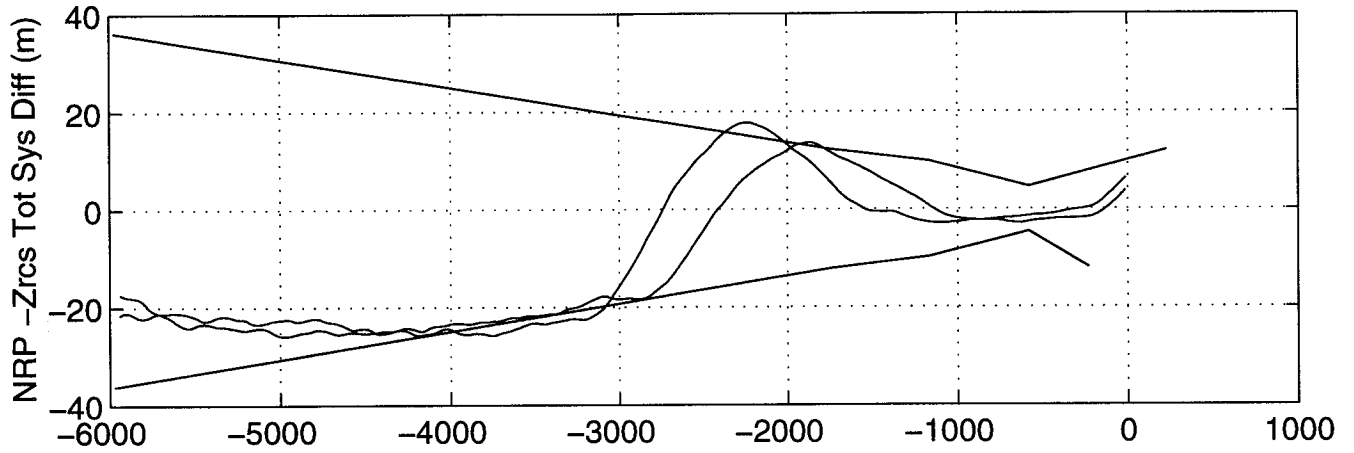


LAT AND VERT TOTAL SYSTEM DIFF ESTIMATE FOR ALL VALID APPROACHES

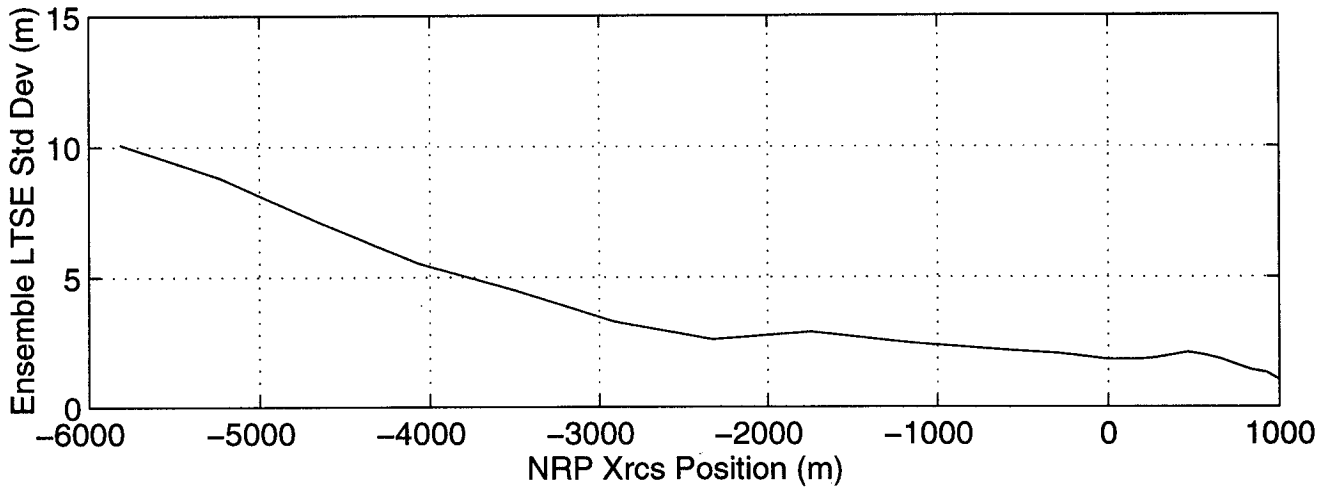
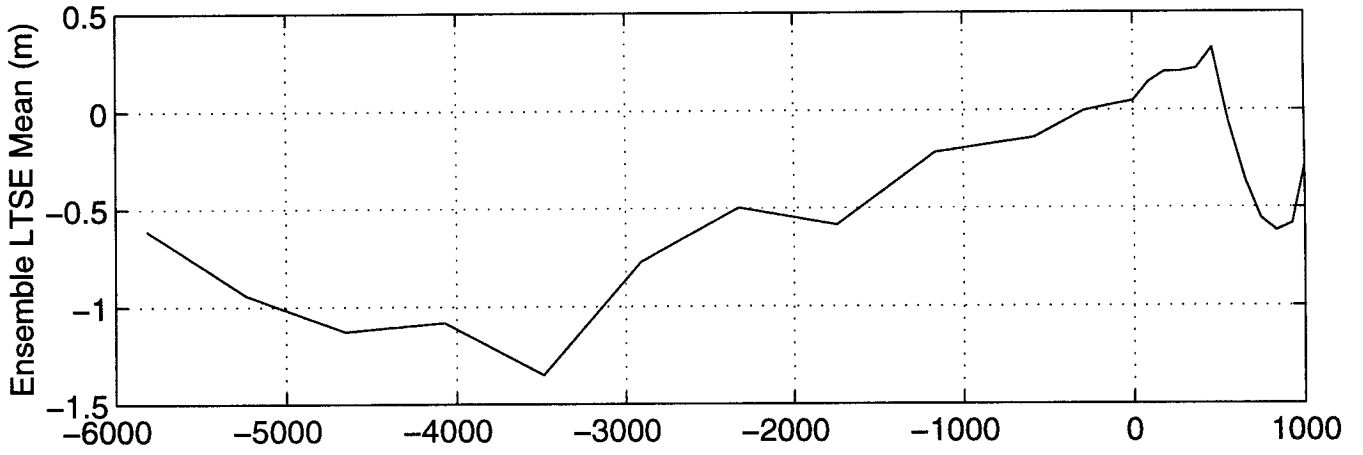




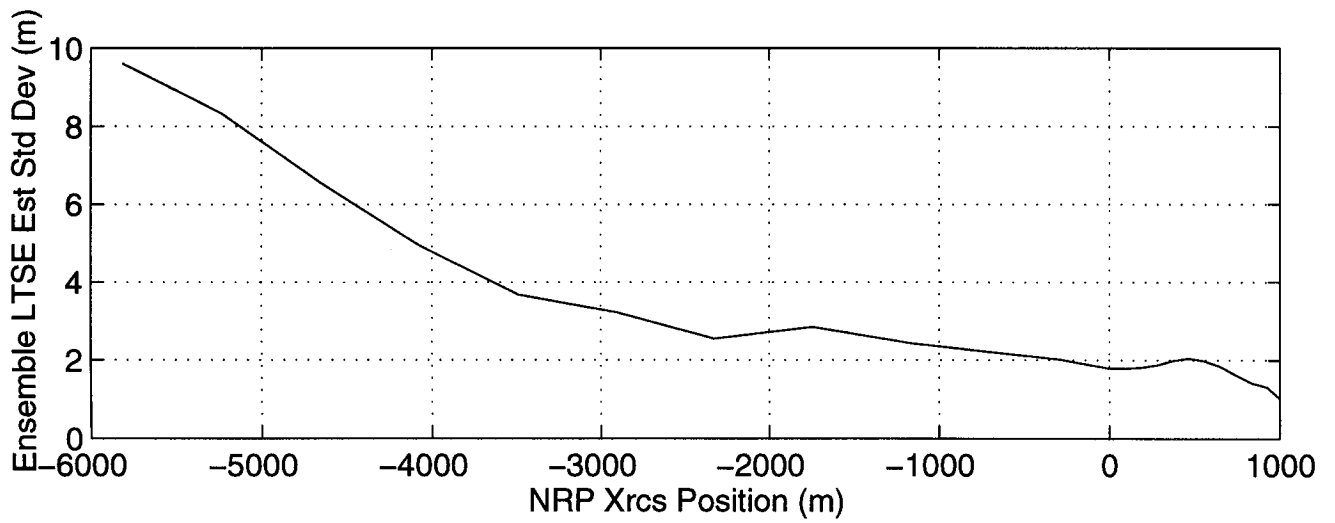
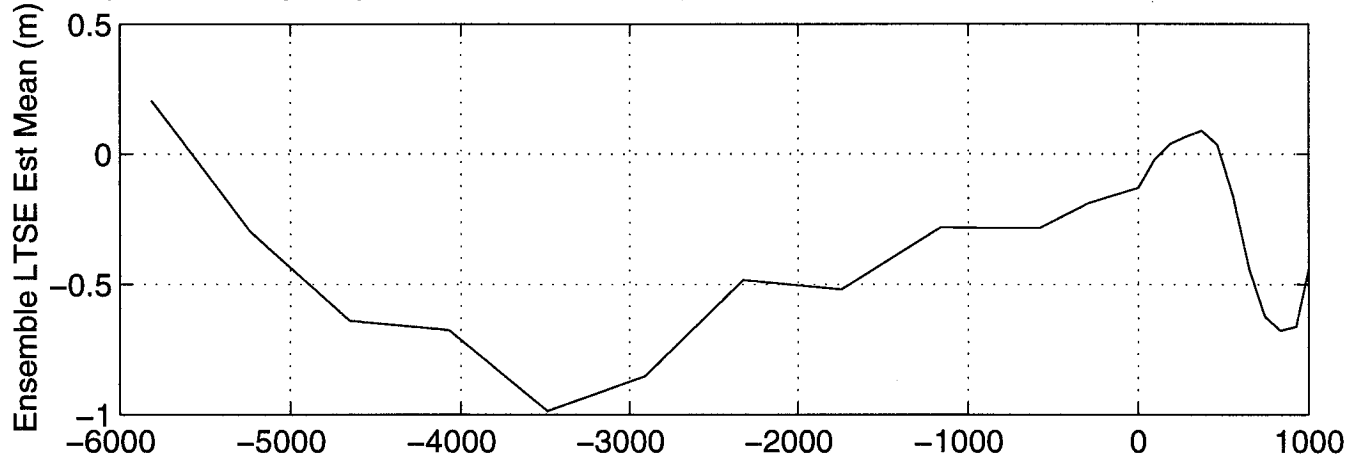
VERT TOTAL SYS DIFF AND VDOP FOR ALL APPROACHES FAILING MOS 3



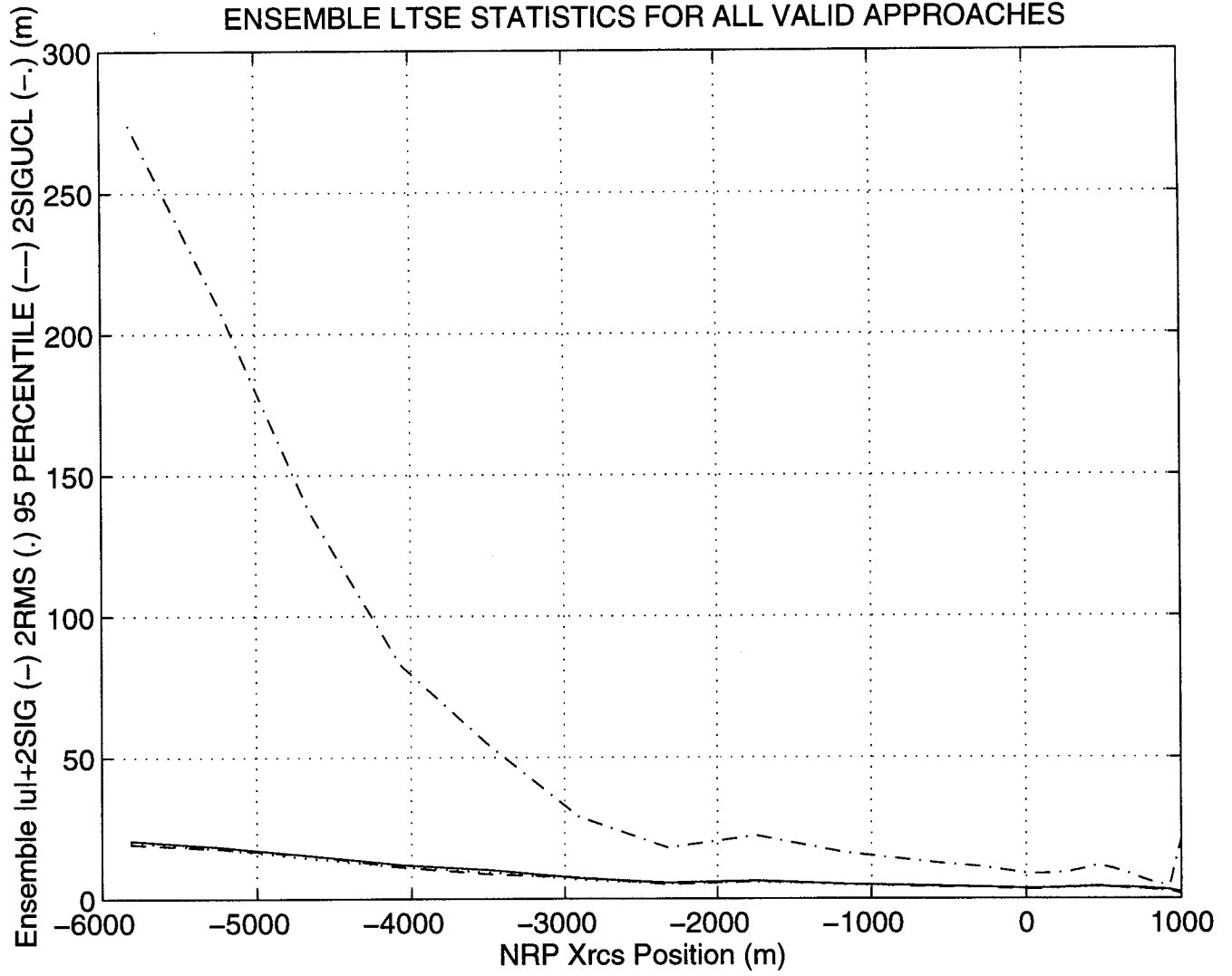
ENSEMBLE LTSE MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES

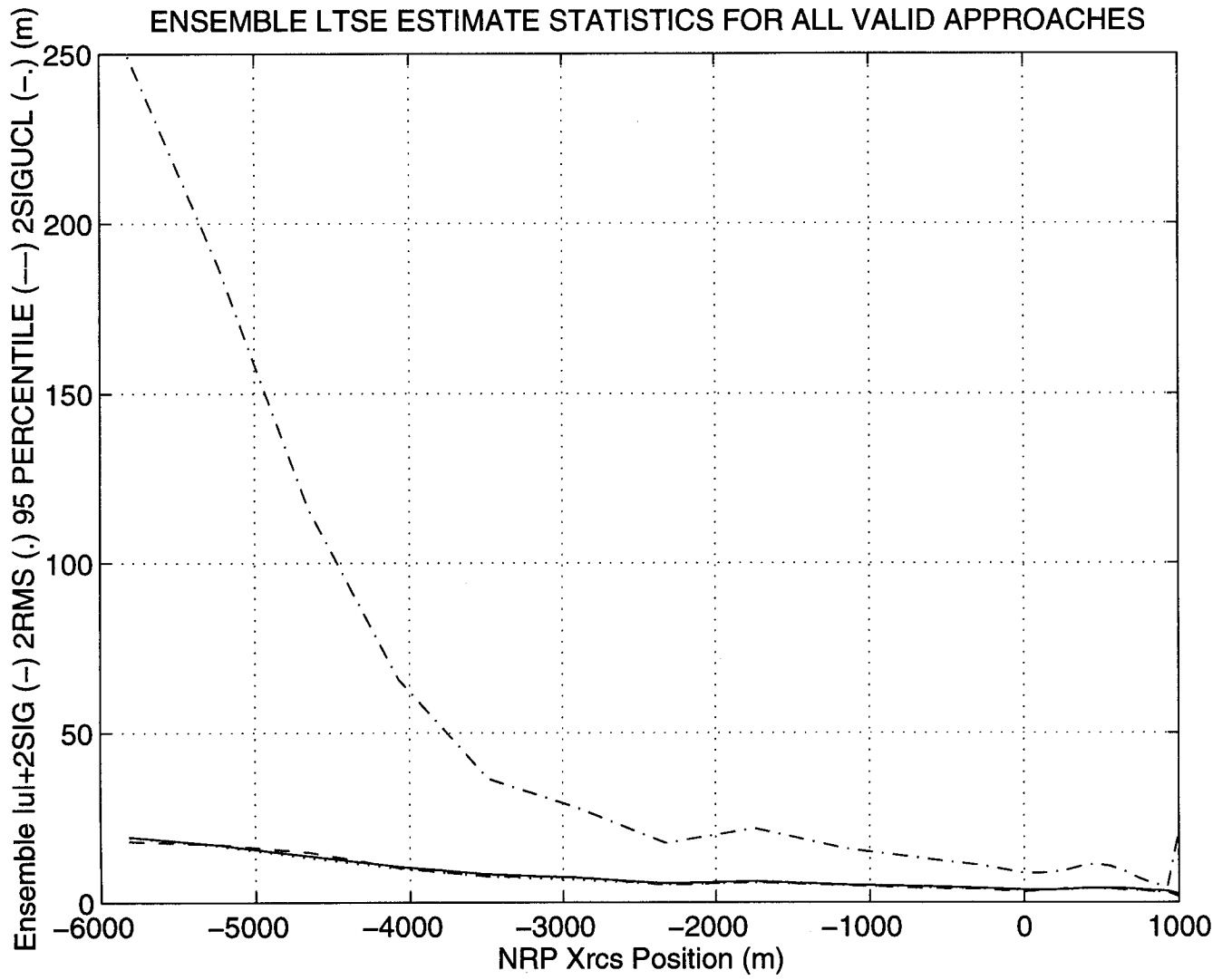


ENSEMBLE LTSE ESTIMATE MEAN AND STD DEVIATION FOR ALL VALID APPROACHES

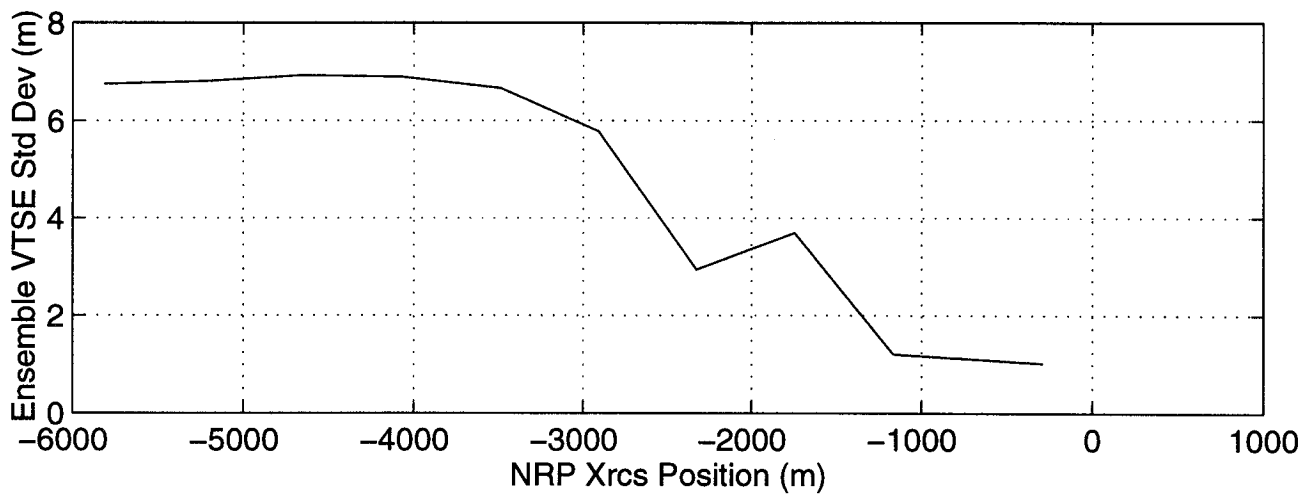
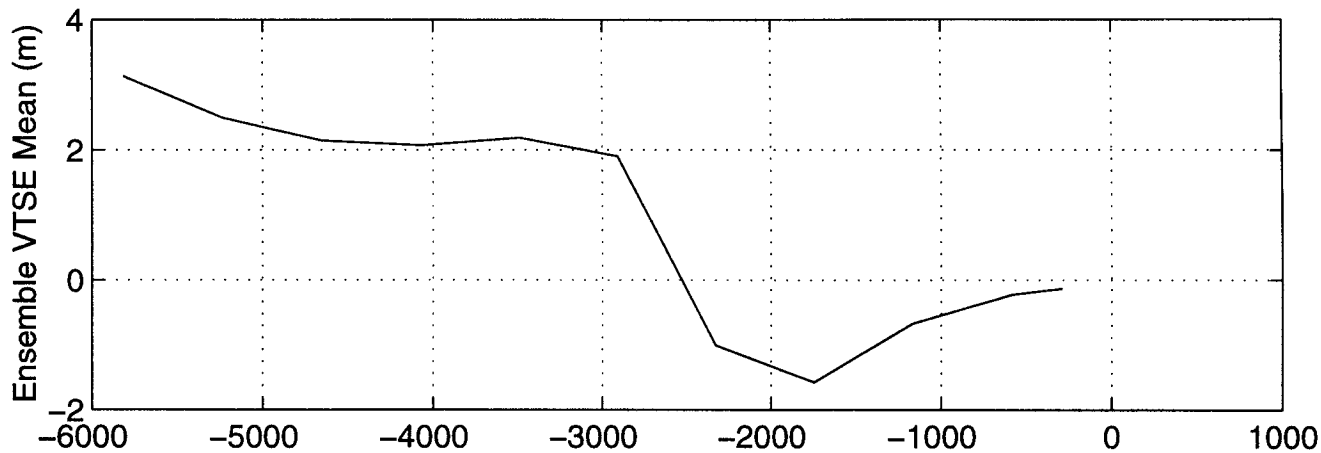


ENSEMBLE LTSE STATISTICS FOR ALL VALID APPROACHES

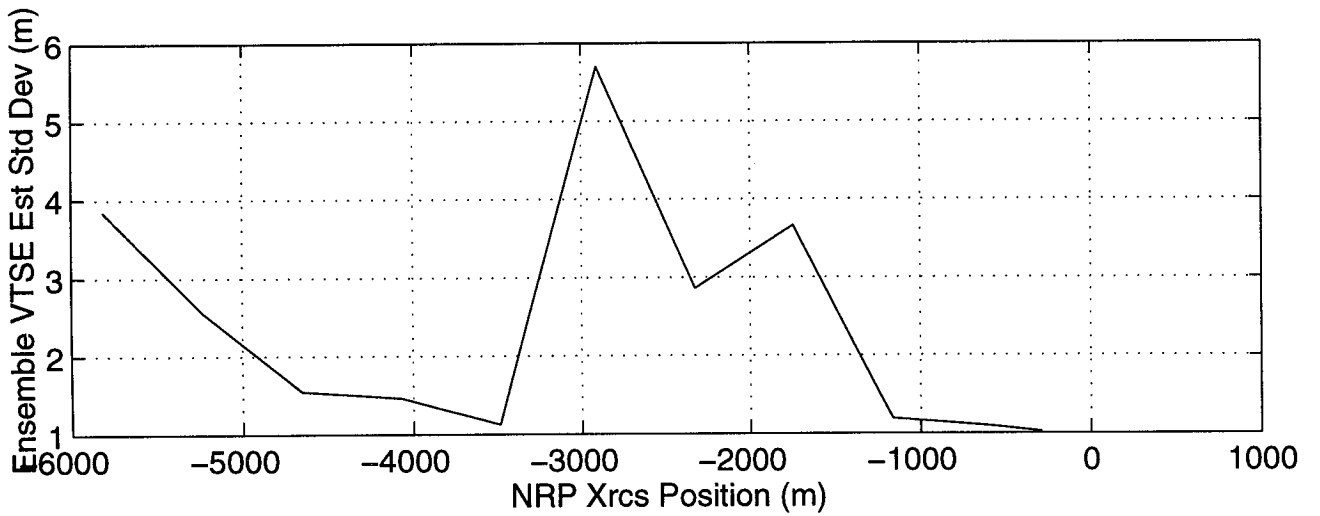
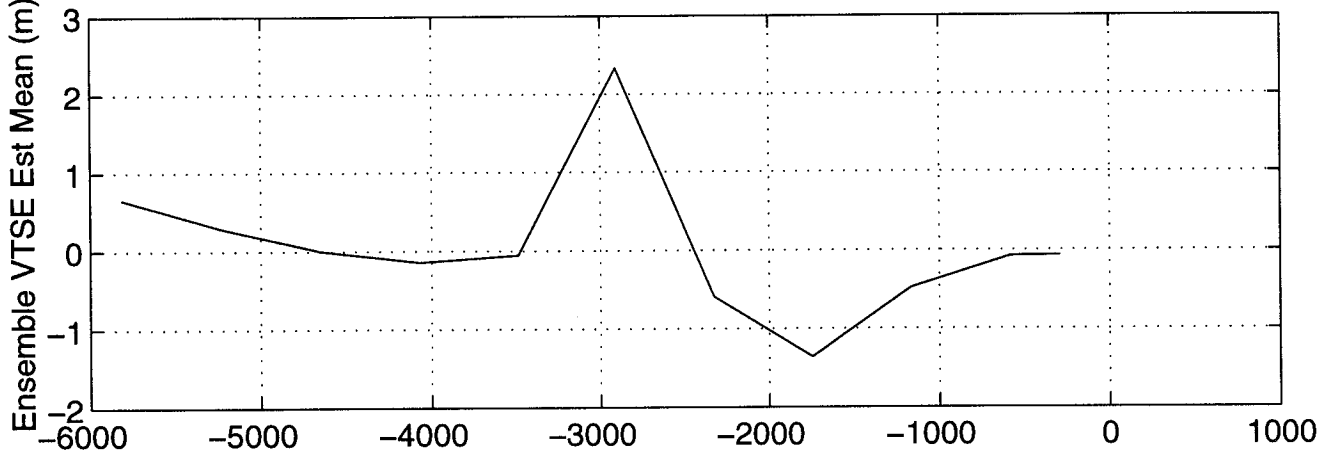




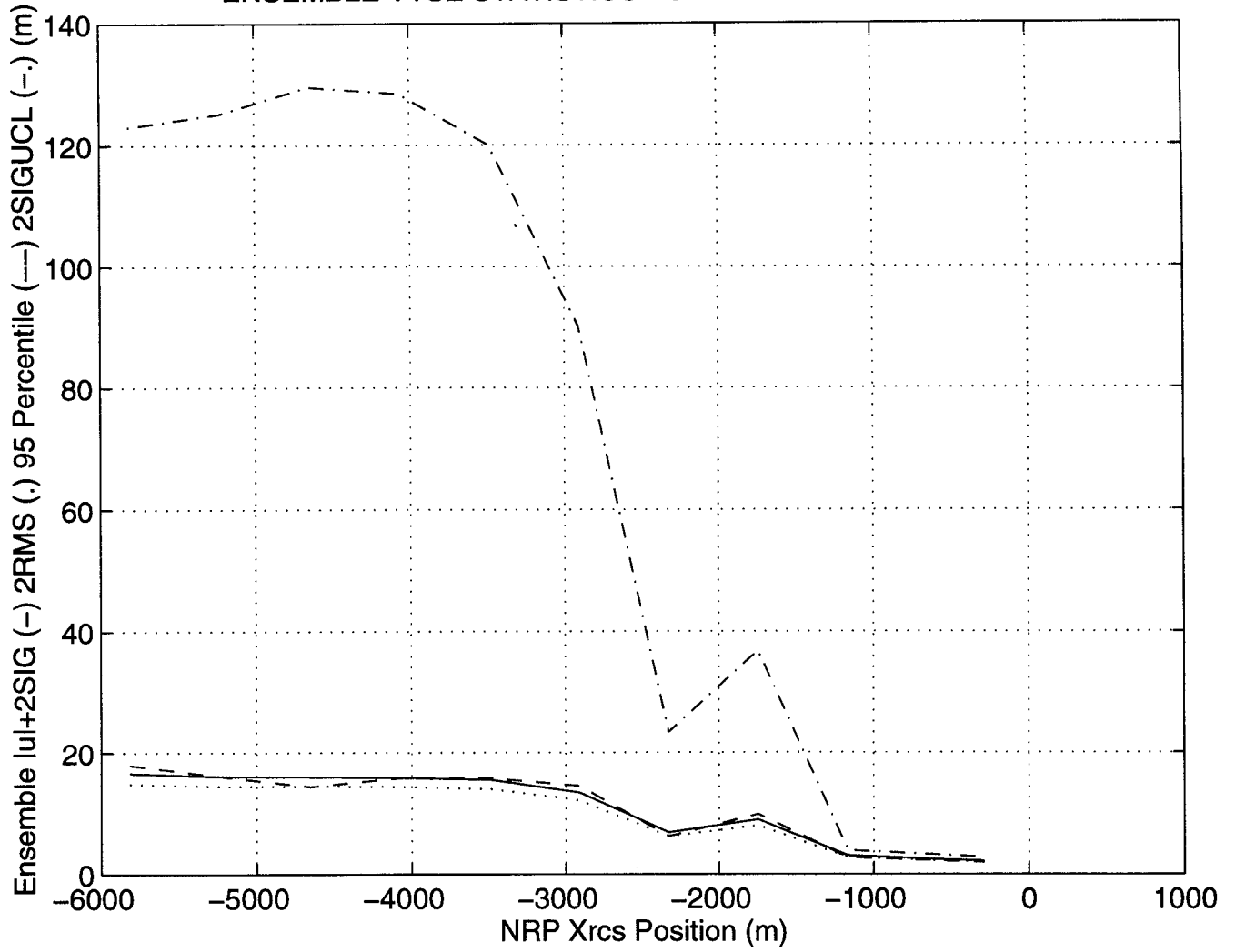
ENSEMBLE VTSE MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES



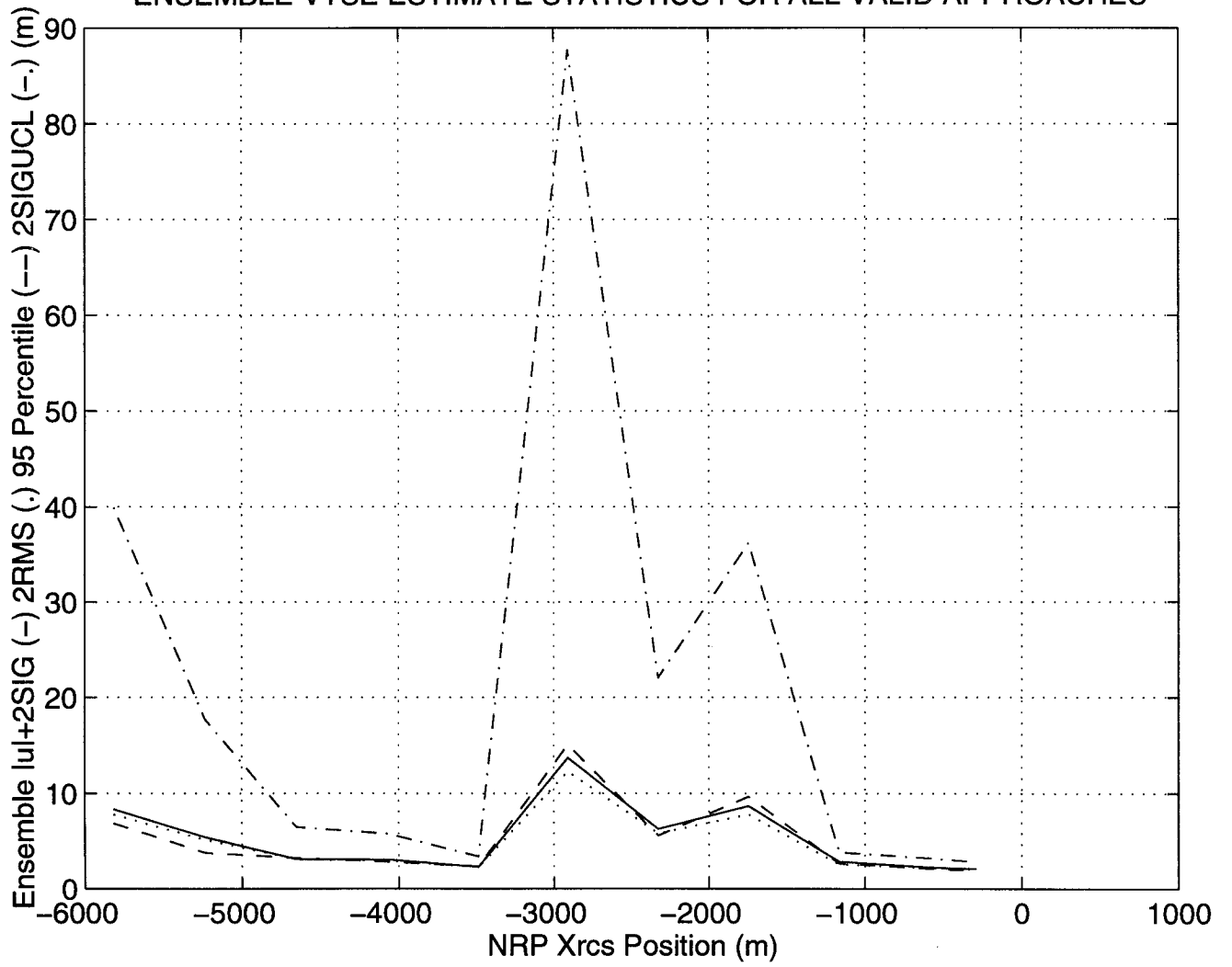
ENSEMBLE VTSE ESTIMATE MEAN AND STD DEVIATION FOR ALL VALID APPROACHES



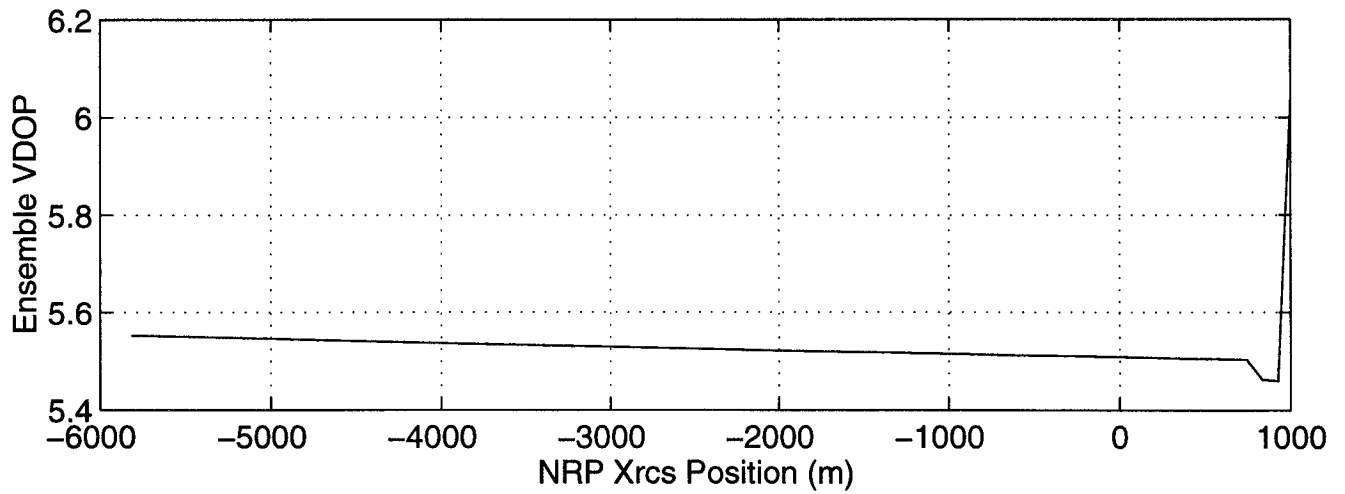
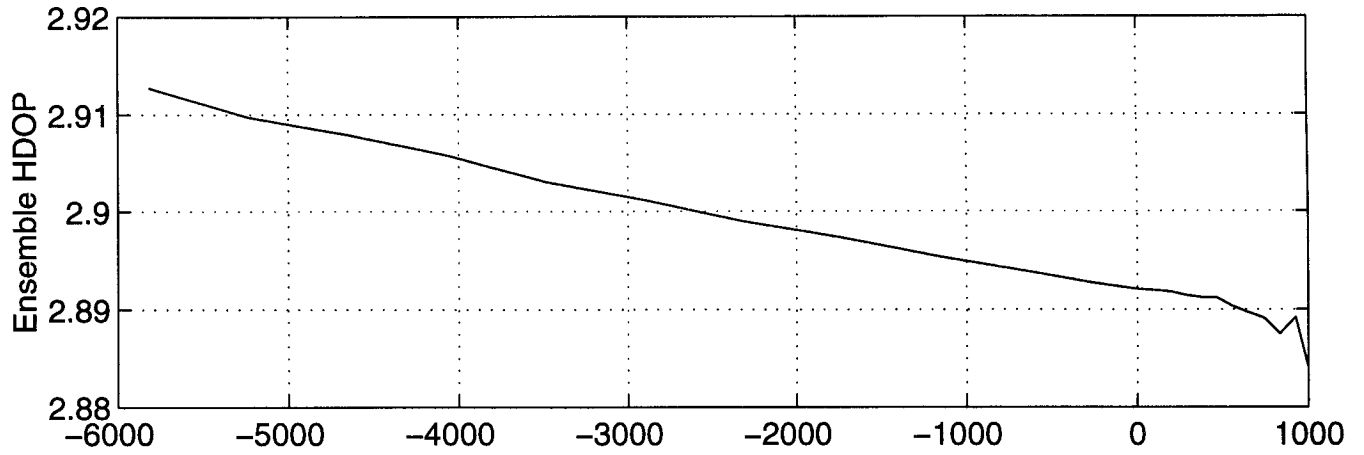
ENSEMBLE VTSE STATISTICS FOR ALL VALID APPROACHES



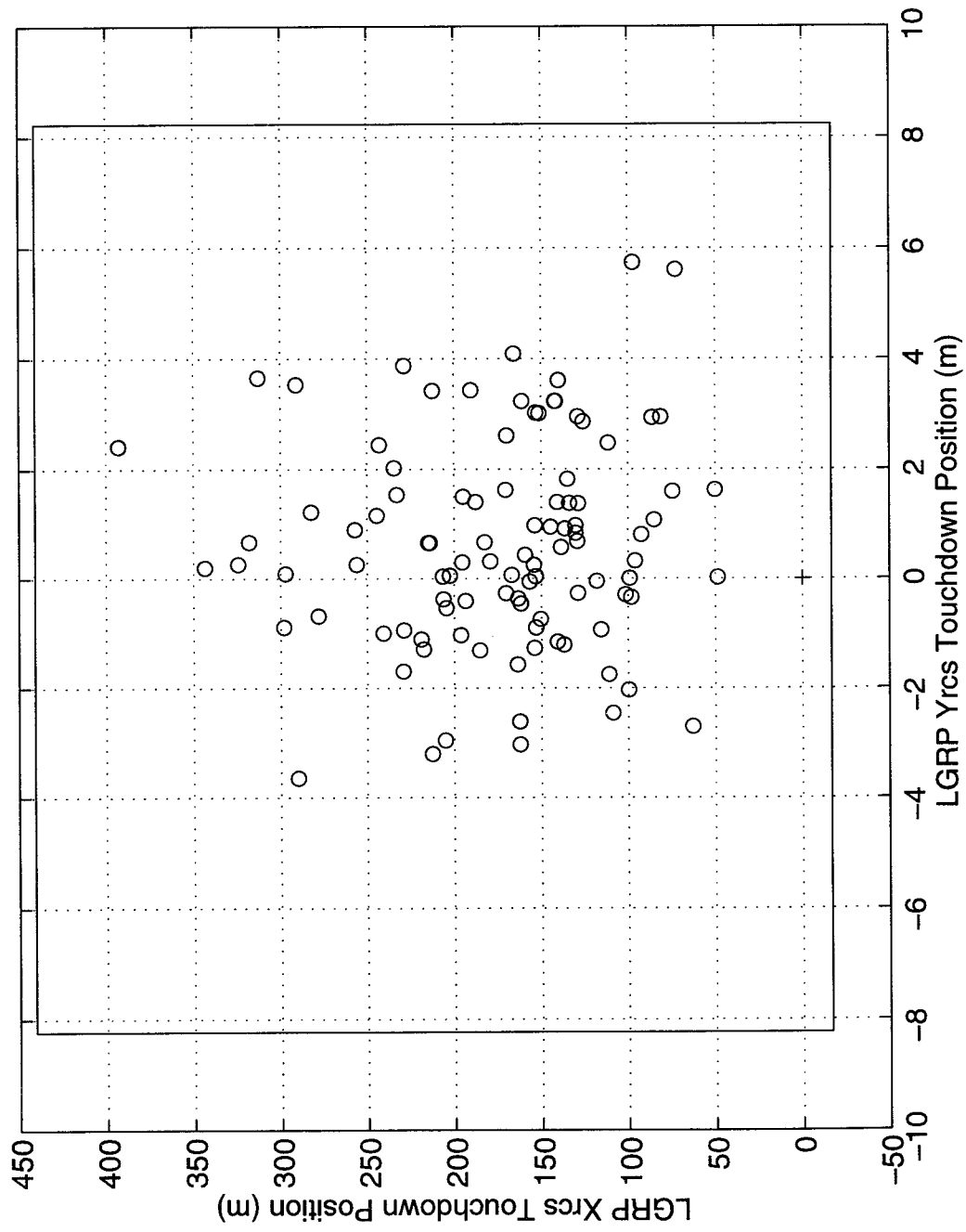
ENSEMBLE VTSE ESTIMATE STATISTICS FOR ALL VALID APPROACHES



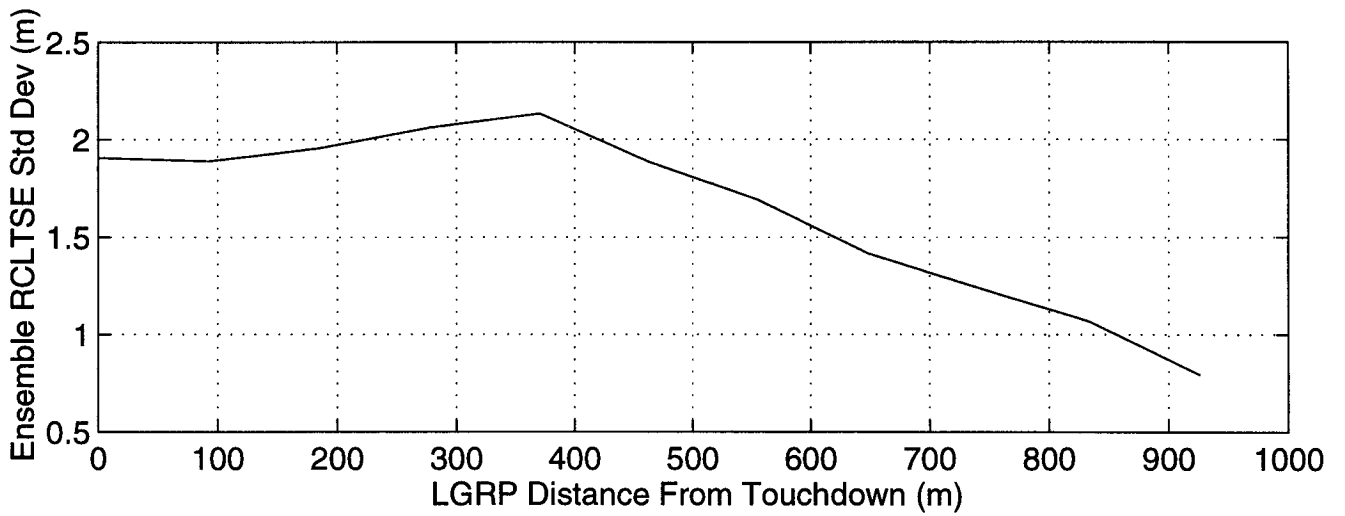
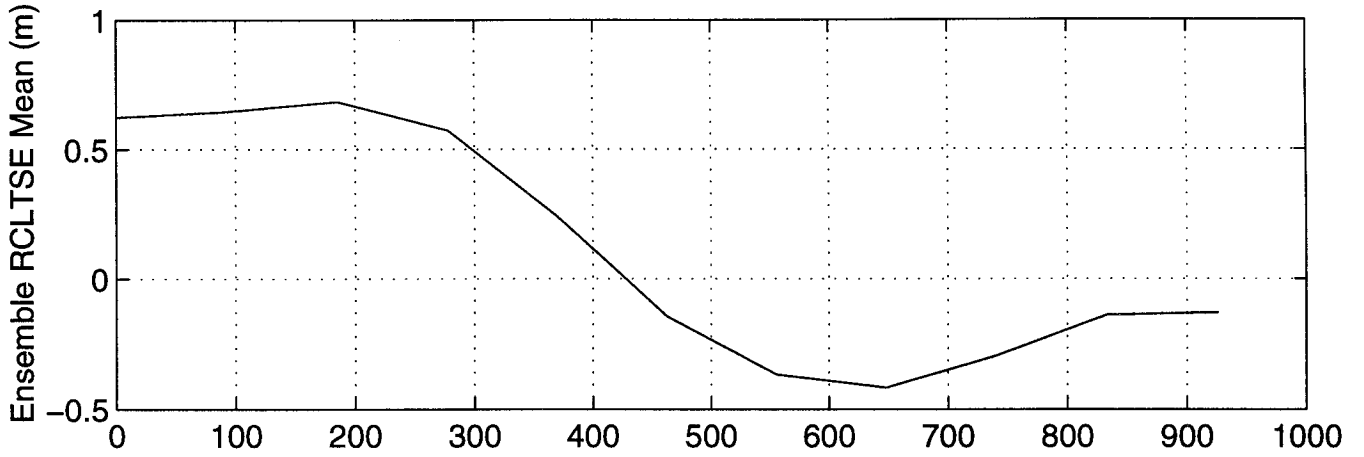
ENSEMBLE MEAN HDOP AND VDOP FOR ALL VALID AND SUCCESSFUL APPROACHES



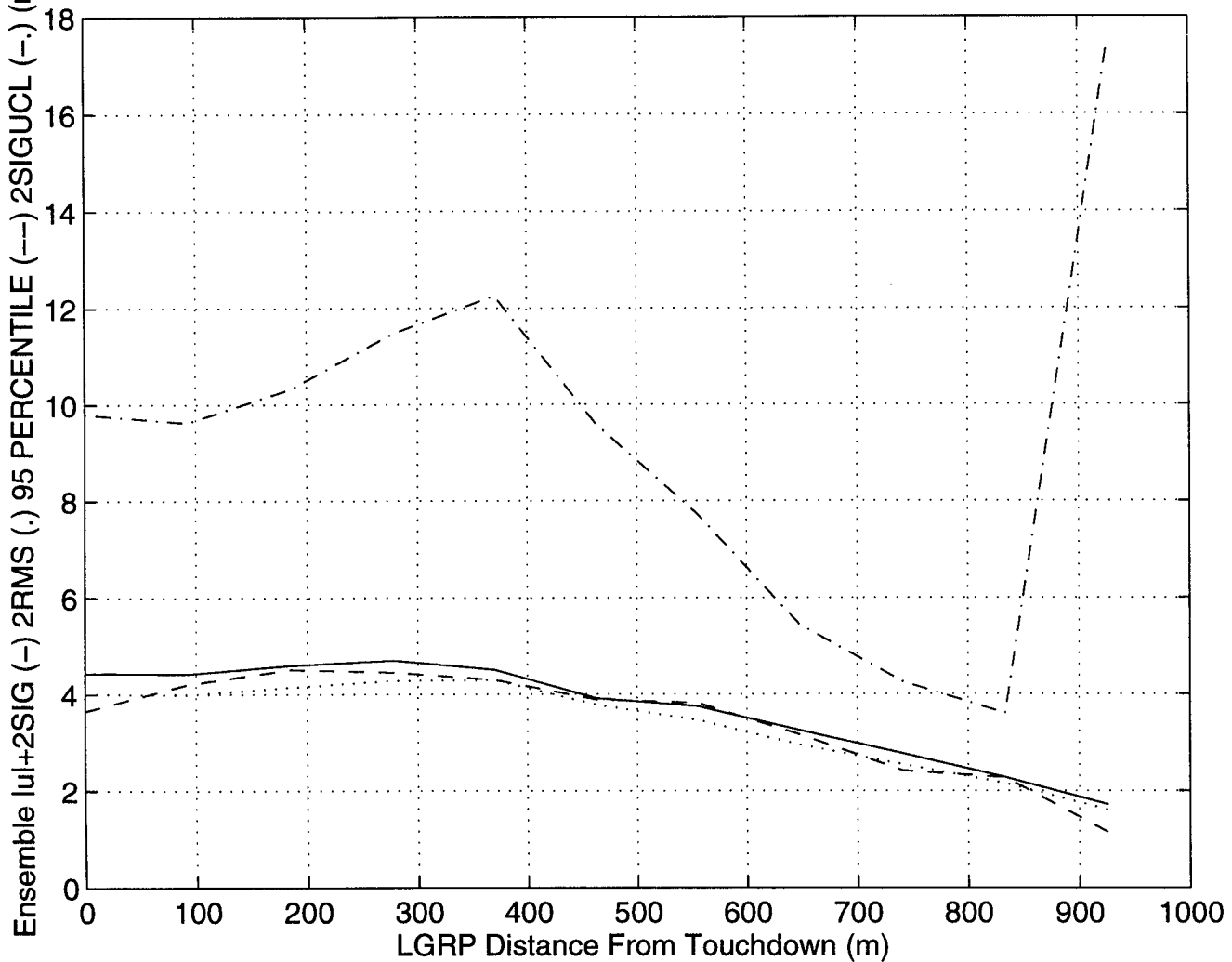
SCATTER PLOT OF THE LGRP TOUCHDOWN POINTS FOR ALL VALID TOUCHDOWNS



ENSEMBLE ROLLOUT CONTROL LTSE MEAN AND STD DEV FOR ALL VALID APPROACHES



ENSEMBLE ROLLOUT CONTROL LTSE STATISTICS FOR ALL VALID APPROACHES



APPENDIX B

NAVIGATION SENSOR ERROR RESULTS

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 * VERTICAL PFE AND CMN PERFORMANCE FOR MOS 1 *

SUCCESSFUL APPROACHES: 50
 VALID APPROACHES: 100

 * FAIL MOS 1 *

 UNFILTERED VERTICAL ERROR ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	15.848	14.259	14.462	120.655
900FT HAT	15.426	13.938	14.226	118.007
800FT HAT	15.256	13.796	13.678	116.025
700FT HAT	15.263	13.779	14.528	114.831
600FT HAT	15.149	13.663	14.974	112.372
500FT HAT	2.623	2.355	1.069	3.245
400FT HAT	0.813	0.921	0.752	0.107
300FT HAT	0.519	0.529	0.446	0.061
200FT HAT	0.424	0.449	0.403	0.036
100FT HAT	0.343	0.360	0.301	0.025
50FT HAT	0.237	0.216	0.220	0.020
AIM POINT	0.237	0.215	0.196	0.020
AP+0.05NM	0.249	0.229	0.233	0.021
AP+0.10NM	0.243	0.230	0.206	0.018
AP+0.15NM	0.305	0.273	0.288	0.039
AP+0.20NM	0.239	0.214	0.238	0.025
AP+0.25NM	0.371	0.336	0.363	0.069
AP+0.30NM	0.290	0.266	0.236	0.028
AP+0.35NM	0.312	0.314	0.255	0.023
AP+0.40NM	0.320	0.296	0.250	0.033
AP+0.45NM	0.302	0.271	0.246	0.044
AP+0.50NM	0.255	0.252	0.232	0.043
AP+0.55NM	0.143	0.177	0.101	0.024

 VERT CONTROL MOTION NOISE ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	0.682	0.674	0.581	0.306
900FT HAT	0.684	0.653	0.538	0.285
800FT HAT	0.582	0.563	0.576	0.213
700FT HAT	0.460	0.444	0.442	0.132
600FT HAT	0.429	0.427	0.405	0.123
500FT HAT	4.796	4.327	5.722	11.293
400FT HAT	0.264	0.263	0.277	0.047
300FT HAT	0.208	0.187	0.184	0.018
200FT HAT	0.103	0.097	0.100	0.006
100FT HAT	0.091	0.090	0.086	0.005
50FT HAT	0.132	0.121	0.110	0.006
AIM POINT	0.118	0.106	0.097	0.006
AP+0.05NM	0.134	0.120	0.093	0.009
AP+0.10NM	0.135	0.123	0.125	0.010
AP+0.15NM	0.164	0.156	0.143	0.016
AP+0.20NM	0.140	0.126	0.115	0.010
AP+0.25NM	0.220	0.218	0.206	0.032
AP+0.30NM	0.230	0.221	0.221	0.015
AP+0.35NM	0.157	0.156	0.129	0.006
AP+0.40NM	0.123	0.115	0.111	0.009
AP+0.45NM	0.167	0.150	0.163	0.013
AP+0.50NM	0.173	0.158	0.150	0.011
AP+0.55NM	0.247	0.245	0.160	0.156

 VERT PATH FOLLOWING ERROR ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	15.591	14.030	14.349	116.886
900FT HAT	15.366	13.875	14.235	116.602
800FT HAT	15.248	13.776	13.788	115.221
700FT HAT	15.226	13.749	14.371	114.482
600FT HAT	15.161	13.674	14.839	112.538
500FT HAT	3.234	3.096	3.338	6.403
400FT HAT	0.756	0.886	0.734	0.082
300FT HAT	0.494	0.549	0.424	0.042
200FT HAT	0.406	0.444	0.387	0.030
100FT HAT	0.329	0.347	0.287	0.022
50FT HAT	0.251	0.241	0.249	0.018
AIM POINT	0.214	0.197	0.184	0.015
AP+0.05NM	0.216	0.200	0.200	0.015
AP+0.10NM	0.214	0.205	0.192	0.013
AP+0.15NM	0.258	0.242	0.239	0.021
AP+0.20NM	0.243	0.219	0.216	0.023
AP+0.25NM	0.241	0.216	0.228	0.027
AP+0.30NM	0.218	0.195	0.184	0.021
AP+0.35NM	0.291	0.284	0.234	0.023
AP+0.40NM	0.303	0.294	0.249	0.025
AP+0.45NM	0.291	0.262	0.240	0.033
AP+0.50NM	0.271	0.248	0.228	0.039
AP+0.55NM	0.243	0.217	0.168	0.256

 * LATERAL PFE AND CMN PERFORMANCE FOR MOS 2 *

SUCCESSFUL APPROACHES: 100
 VALID APPROACHES: 100

\$\$\$\$\$\$\$\$\$\$\$\$
 \$ PASS MOS 2 \$
 \$\$\$\$\$\$\$\$\$\$\$\$

 UNFILTERED LATERAL ERROR ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	5.435	4.898	4.715	14.377
900FT HAT	4.849	4.397	4.152	11.921
800FT HAT	4.638	4.263	3.985	11.617
700FT HAT	4.315	3.992	3.793	10.307
600FT HAT	4.185	3.889	3.625	9.842
500FT HAT	0.714	0.654	0.782	0.272
400FT HAT	0.460	0.447	0.433	0.134
300FT HAT	0.371	0.332	0.325	0.063
200FT HAT	0.286	0.256	0.258	0.033
100FT HAT	0.365	0.362	0.310	0.033
50FT HAT	0.437	0.447	0.371	0.043
AIM POINT	0.463	0.455	0.461	0.055
AP+0.05NM	0.473	0.453	0.518	0.063
AP+0.10NM	0.448	0.428	0.432	0.058
AP+0.15NM	0.382	0.362	0.411	0.043
AP+0.20NM	0.422	0.387	0.437	0.060
AP+0.25NM	1.064	0.964	1.070	0.413
AP+0.30NM	0.757	0.686	0.241	0.290
AP+0.35NM	0.378	0.338	0.293	0.058
AP+0.40NM	0.282	0.253	0.150	0.031
AP+0.45NM	0.243	0.218	0.130	0.023
AP+0.50NM	0.196	0.197	0.165	0.009
AP+0.55NM	0.386	0.405	0.302	0.316

 LAT CONTROL MOTION NOISE ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	0.478	0.455	0.446	0.138
900FT HAT	0.460	0.414	0.404	0.103
800FT HAT	0.449	0.402	0.366	0.092
700FT HAT	0.376	0.340	0.327	0.071
600FT HAT	0.290	0.289	0.303	0.056
500FT HAT	1.863	1.728	2.064	1.939
400FT HAT	0.334	0.313	0.303	0.064
300FT HAT	0.220	0.204	0.196	0.027
200FT HAT	0.193	0.174	0.152	0.014
100FT HAT	0.142	0.127	0.135	0.009
50FT HAT	0.186	0.170	0.164	0.018
AIM POINT	0.206	0.194	0.185	0.025
AP+0.05NM	0.224	0.211	0.227	0.029
AP+0.10NM	0.222	0.205	0.245	0.027
AP+0.15NM	0.203	0.183	0.194	0.020
AP+0.20NM	0.191	0.173	0.177	0.018
AP+0.25NM	0.736	0.660	0.846	0.250
AP+0.30NM	0.481	0.436	0.358	0.117
AP+0.35NM	0.264	0.236	0.237	0.030
AP+0.40NM	0.338	0.306	0.193	0.057
AP+0.45NM	0.226	0.203	0.124	0.024
AP+0.50NM	0.174	0.169	0.083	0.019
AP+0.55NM	0.249	0.223	0.171	0.282

 LAT PATH FOLLOWING ERROR ESTIMATION STATISTICS

LOCATION	u +2SIG(m)	2RMS(m)	95P(m)	2SIGUCL(m)
1000FT HAT	3.419	3.085	3.042	5.739
900FT HAT	4.953	4.476	4.151	12.187
800FT HAT	4.668	4.259	3.947	11.402
700FT HAT	4.388	4.039	3.797	10.461
600FT HAT	4.195	3.903	3.724	9.934
500FT HAT	1.729	1.675	1.909	1.885
400FT HAT	0.330	0.315	0.302	0.066
300FT HAT	0.297	0.266	0.239	0.040
200FT HAT	0.214	0.196	0.193	0.025
100FT HAT	0.301	0.304	0.263	0.021
50FT HAT	0.370	0.395	0.348	0.027
AIM POINT	0.464	0.479	0.454	0.047
AP+0.05NM	0.441	0.454	0.407	0.043
AP+0.10NM	0.428	0.435	0.437	0.042
AP+0.15NM	0.400	0.401	0.405	0.038
AP+0.20NM	0.377	0.371	0.411	0.037
AP+0.25NM	0.423	0.397	0.507	0.054
AP+0.30NM	0.613	0.561	0.566	0.129
AP+0.35NM	0.620	0.556	0.340	0.154
AP+0.40NM	0.461	0.414	0.254	0.084
AP+0.45NM	0.317	0.288	0.217	0.036
AP+0.50NM	0.245	0.226	0.145	0.020
AP+0.55NM	0.132	0.208	0.114	0.006

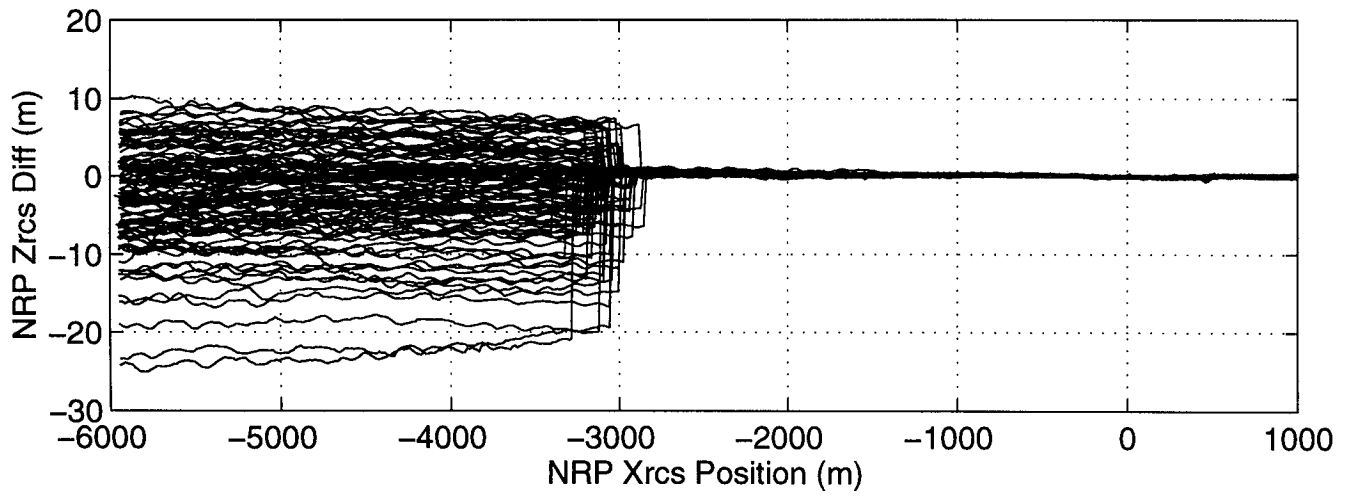
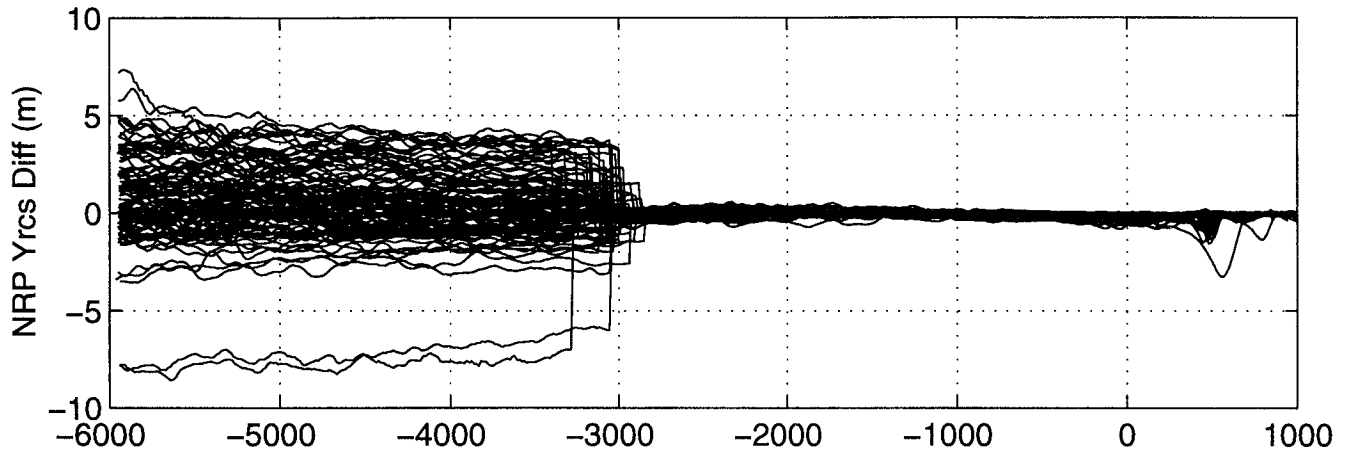
*LAT AND VERT INTEGRITY PERFORMANCE FOR MOS 6 *

VERTICAL TIME TO ALARM 2 SECONDS OR LESS
NUMBER OF MISSED VERTICAL ALARMS: 0
NUMBER OF FALSE VERTICAL ALARMS: 0

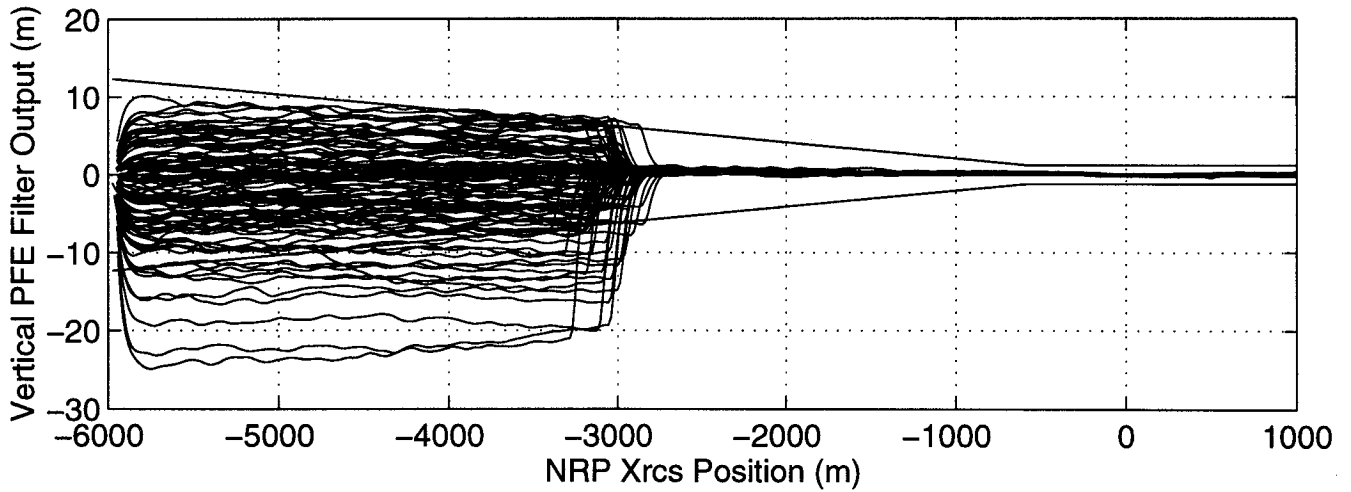
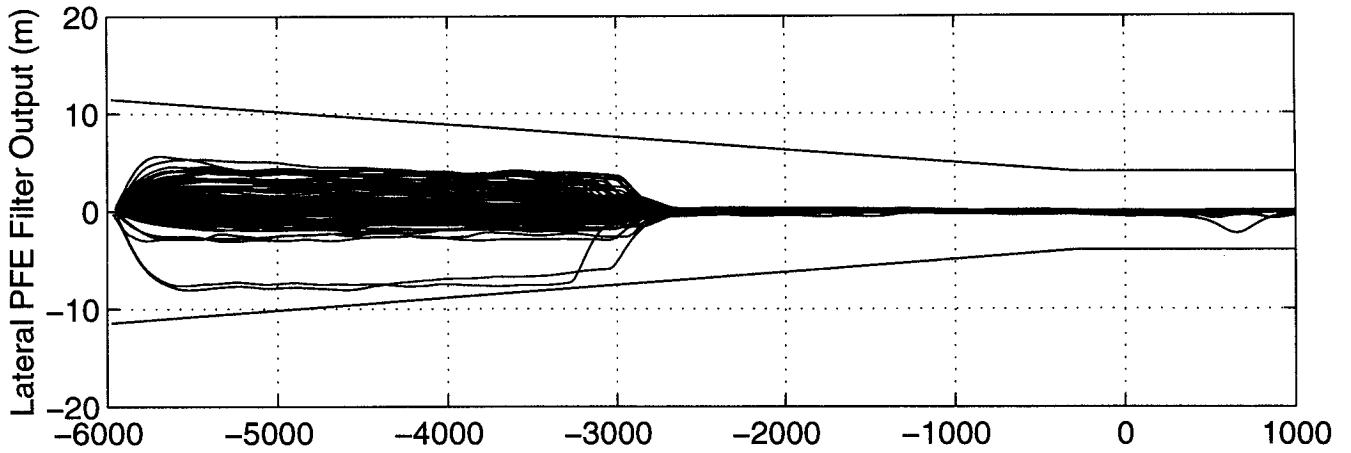
LATERAL TIME TO ALARM 2 SECONDS OR LESS
NUMBER OF MISSED LATERAL ALARMS: 0
NUMBER OF FALSE LATERAL ALARMS: 0

\$\$\$\$\$\$\$\$\$\$\$\$
\$ PASS MOS 6 \$
\$\$\$\$\$\$\$\$\$\$\$\$

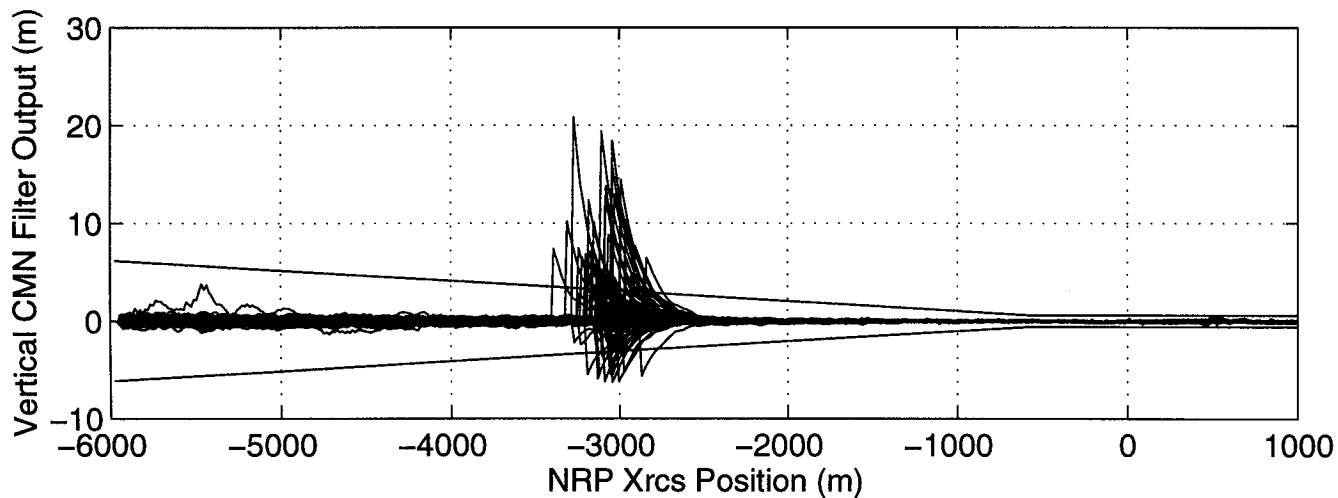
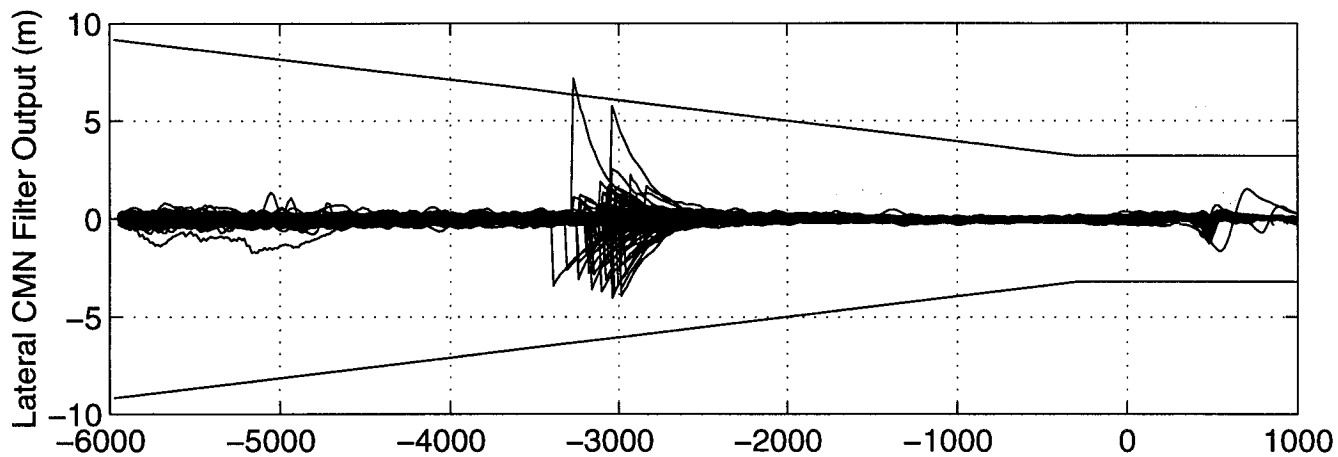
LATERAL AND VERTICAL UNFILTERED ERROR FOR ALL VALID APPROACHES



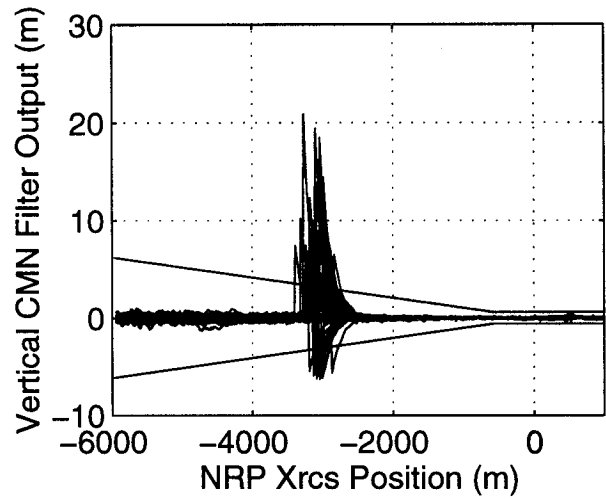
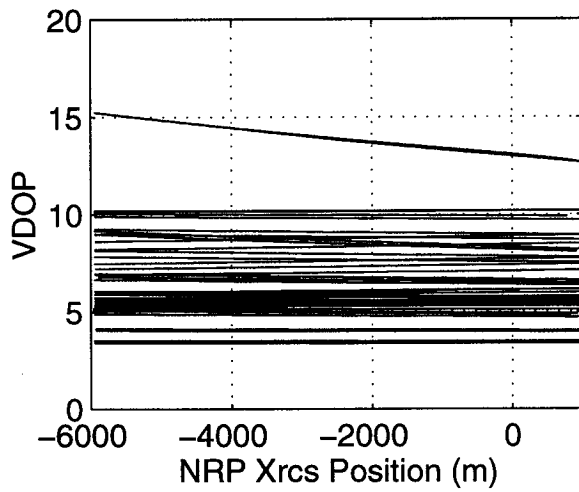
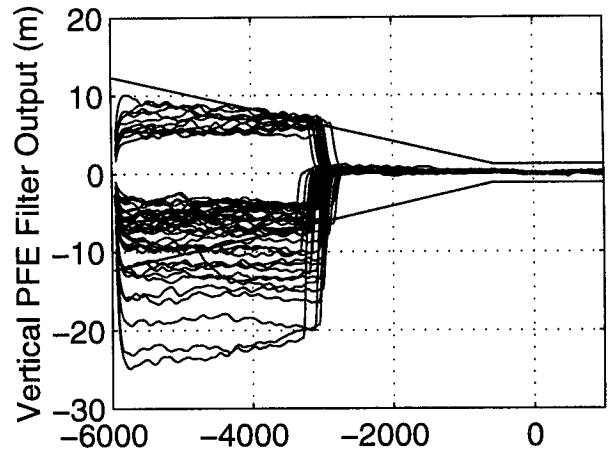
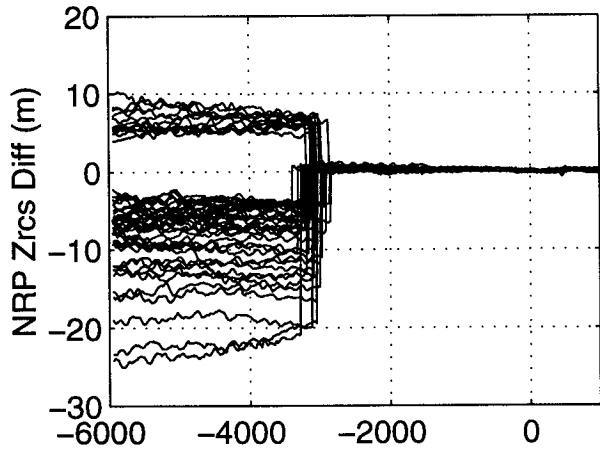
LATERAL AND VERTICAL PFE FILTER OUTPUT FOR ALL VALID APPROACHES



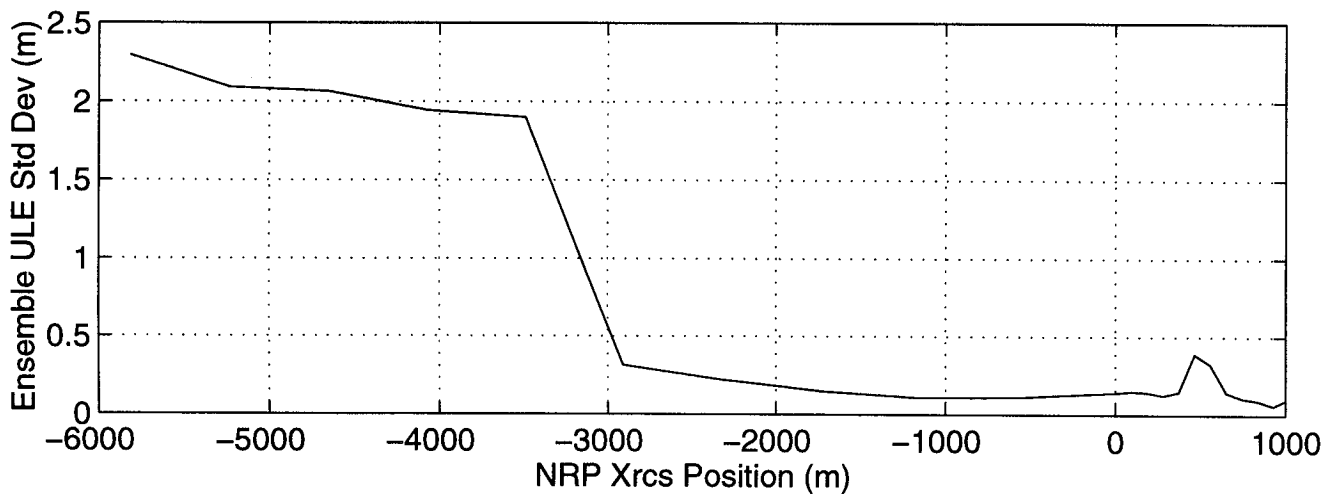
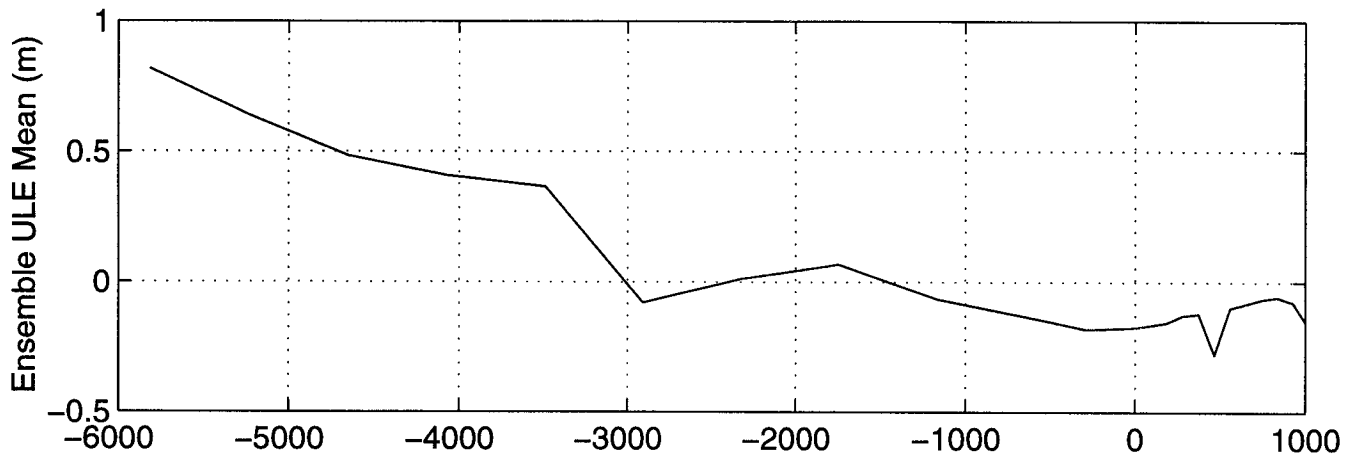
LATERAL AND VERTICAL CMN FILTER OUTPUT FOR ALL VALID APPROACHES



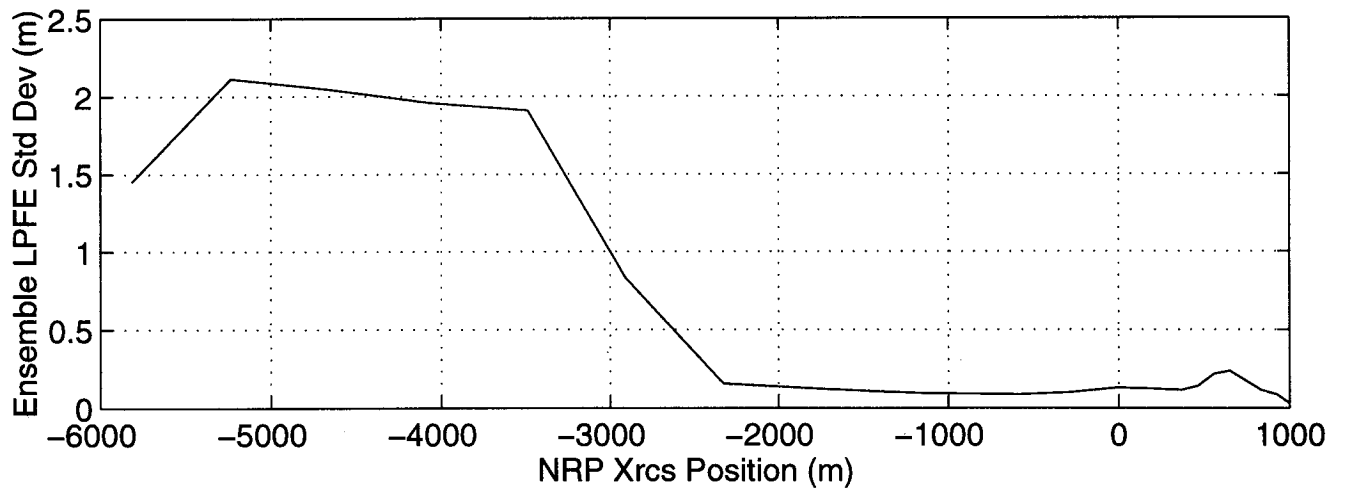
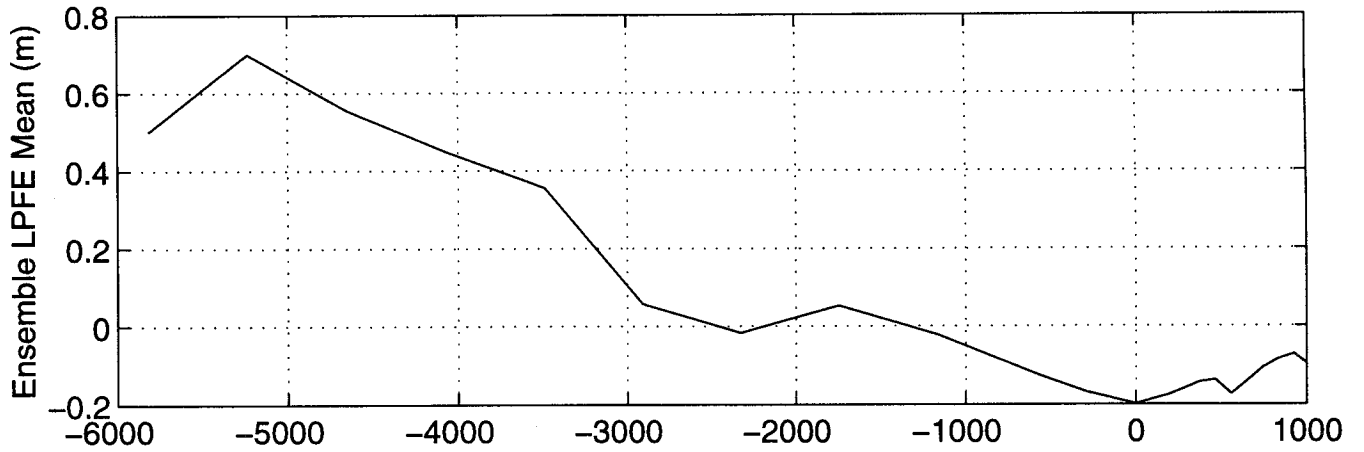
VERT DIFF, PFE & CMN FILTER OUTPUT AND VDOP FOR ALL APPROACHES FAILING MOS 1



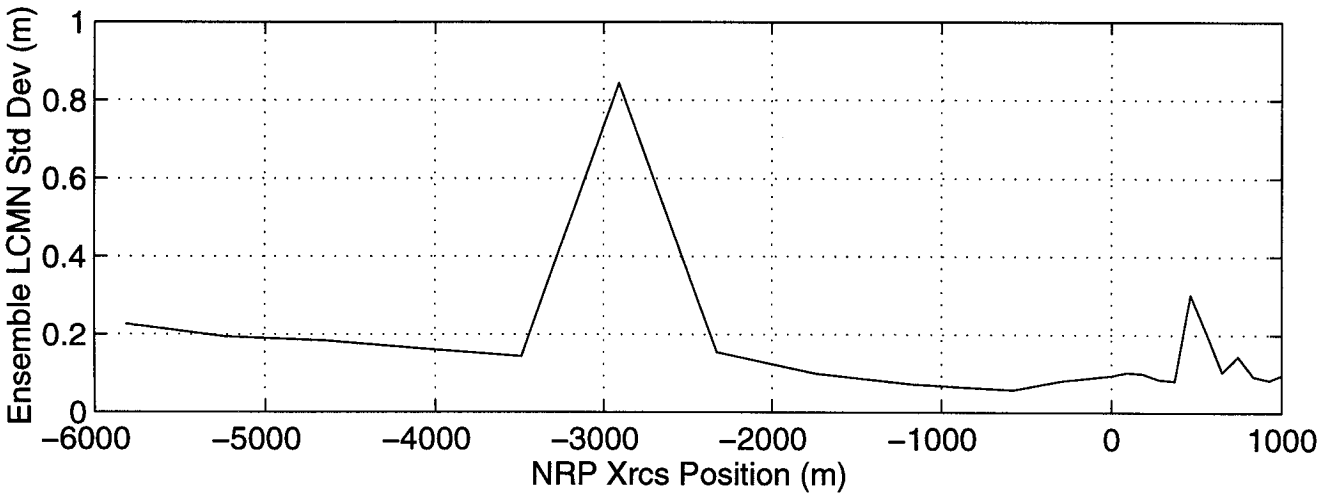
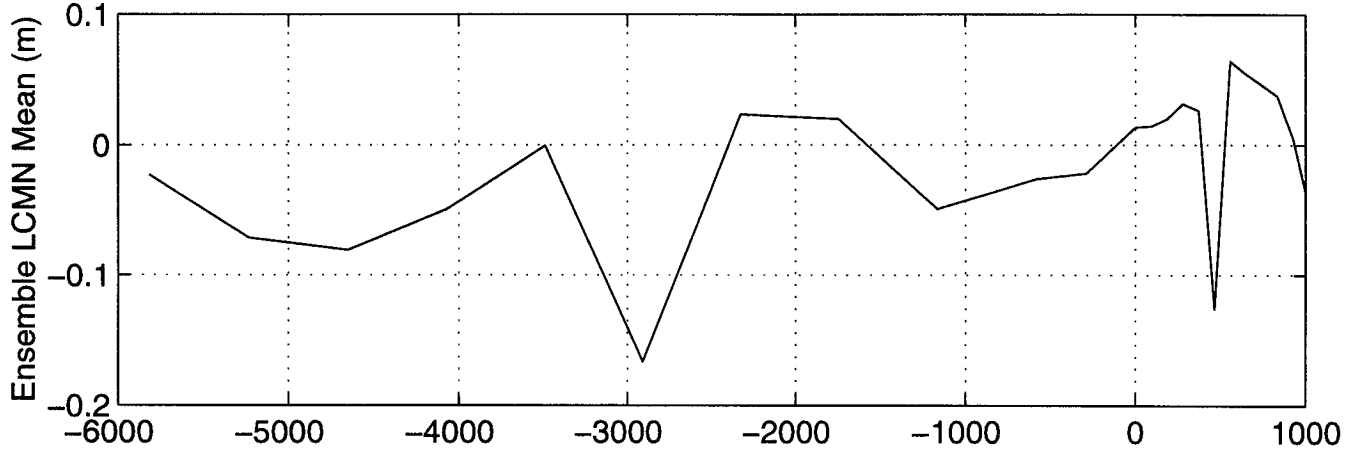
ENSEMBLE ULE MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES



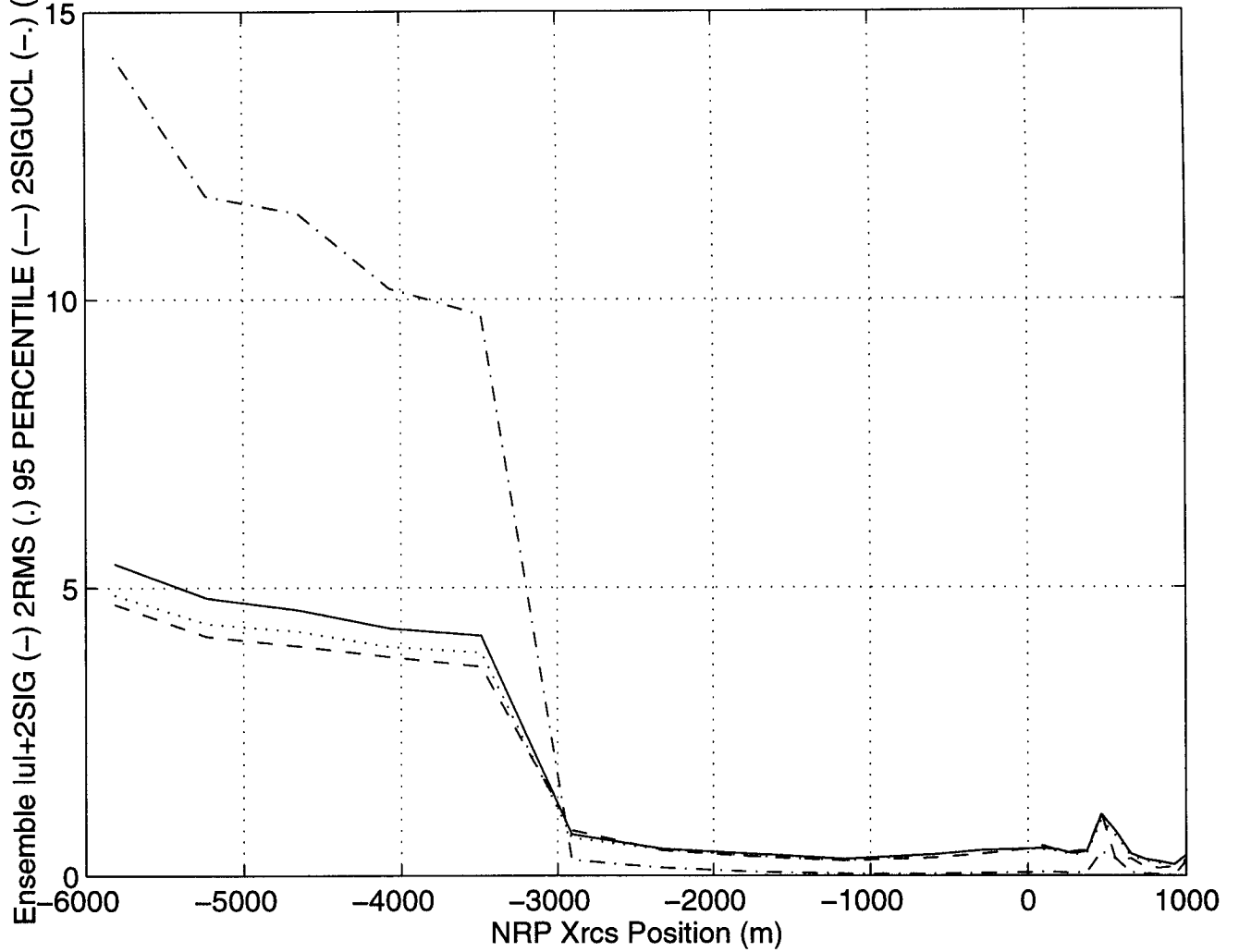
ENSEMBLE LPFE MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES



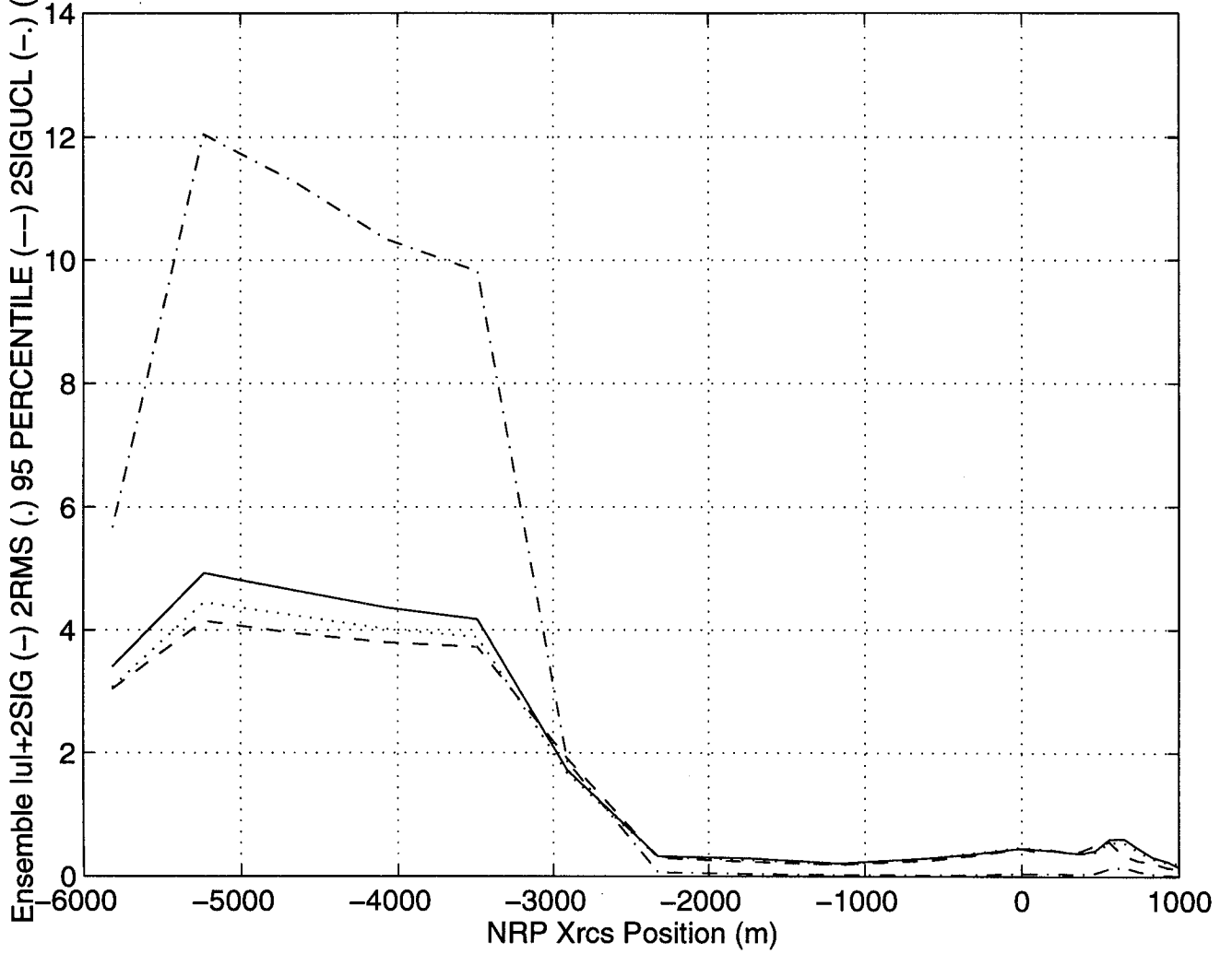
ENSEMBLE LCMN MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES



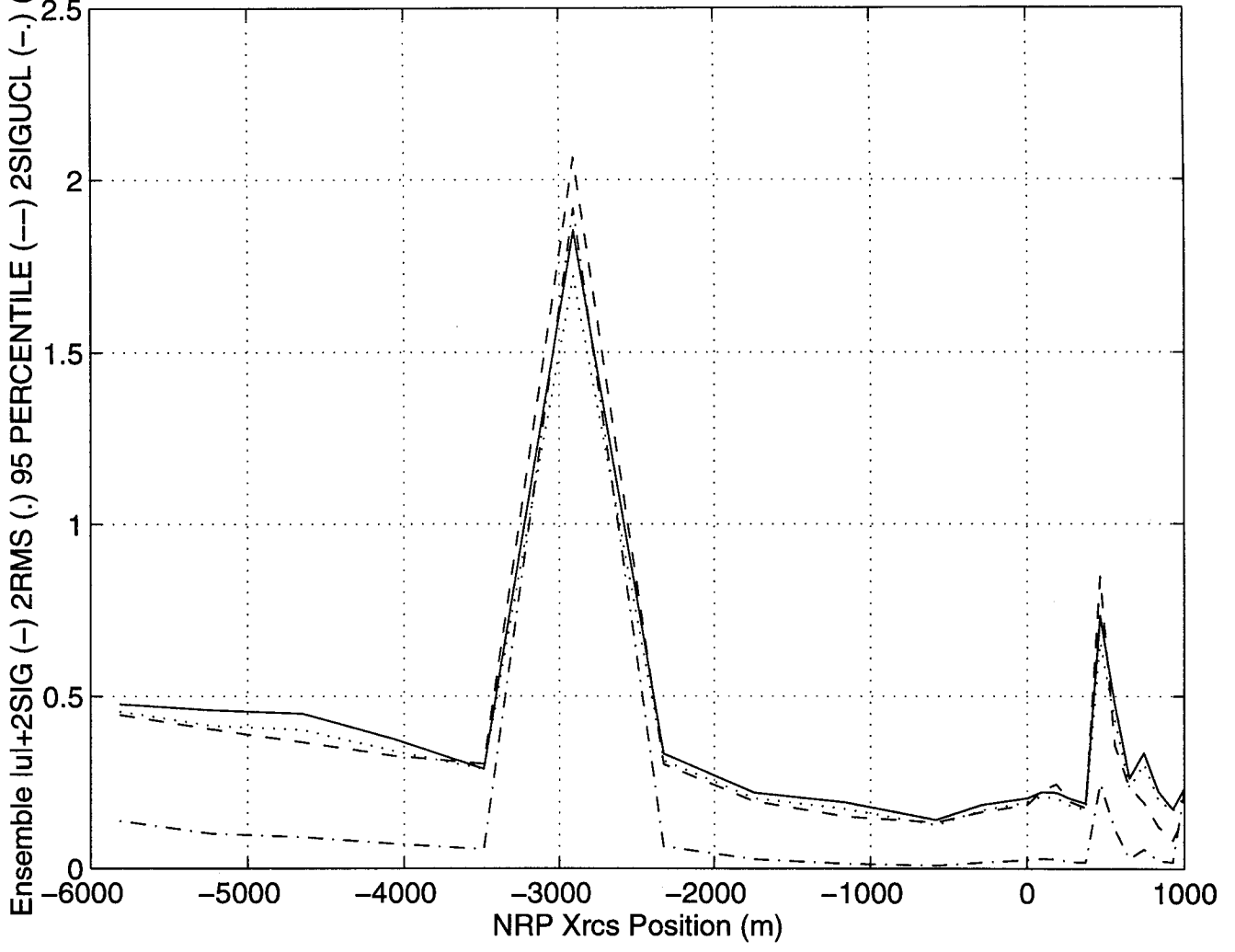
ENSEMBLE UNFILTERED LATERAL ERROR STATISTICS FOR ALL VALID APPROACHES



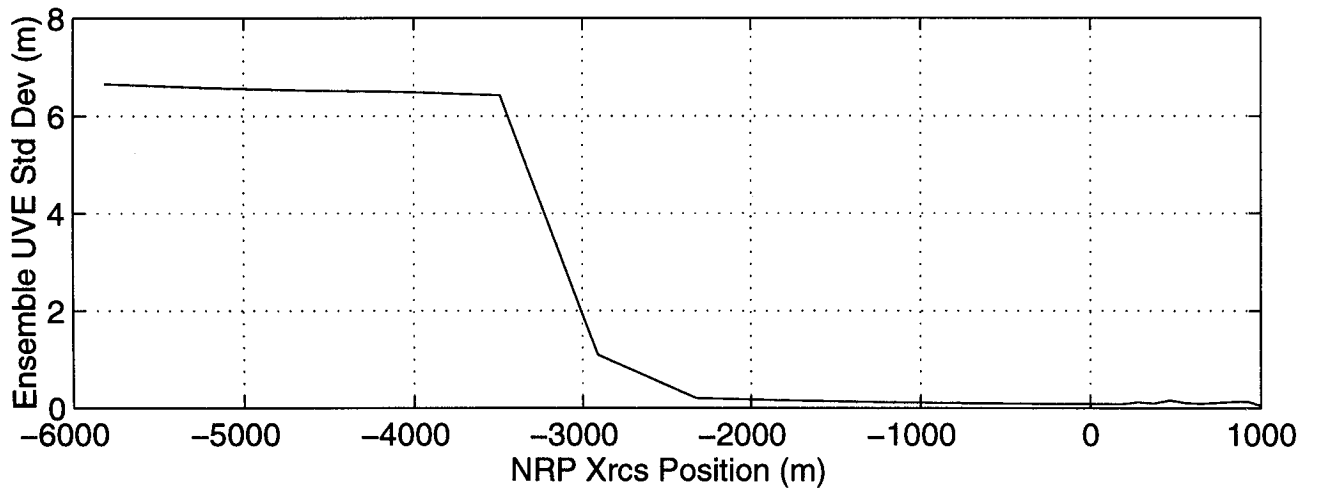
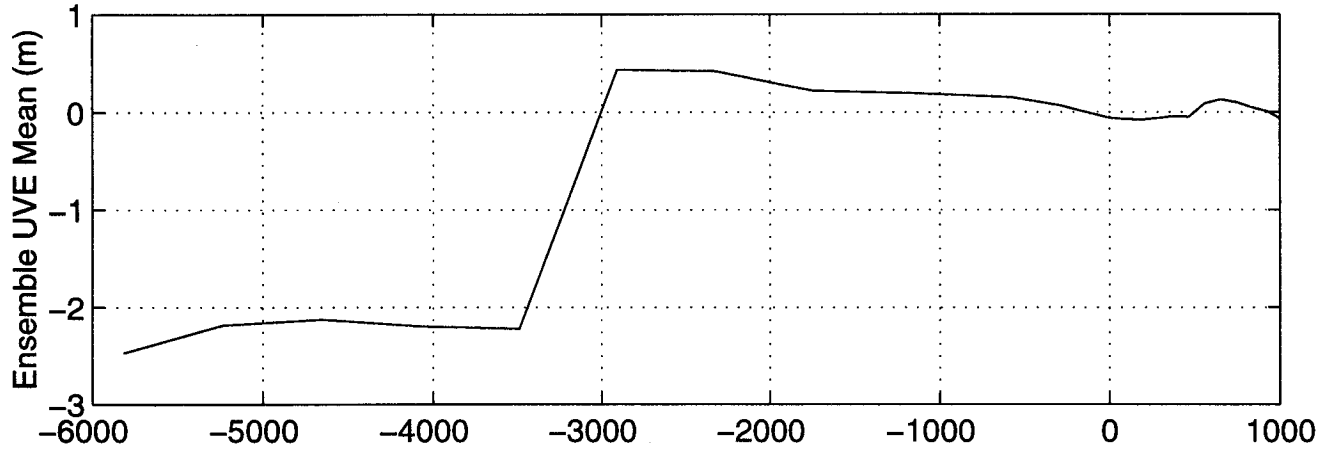
ENSEMBLE LAT PATH FOLLOWING ERROR STATISTICS FOR ALL VALID APPROACHES



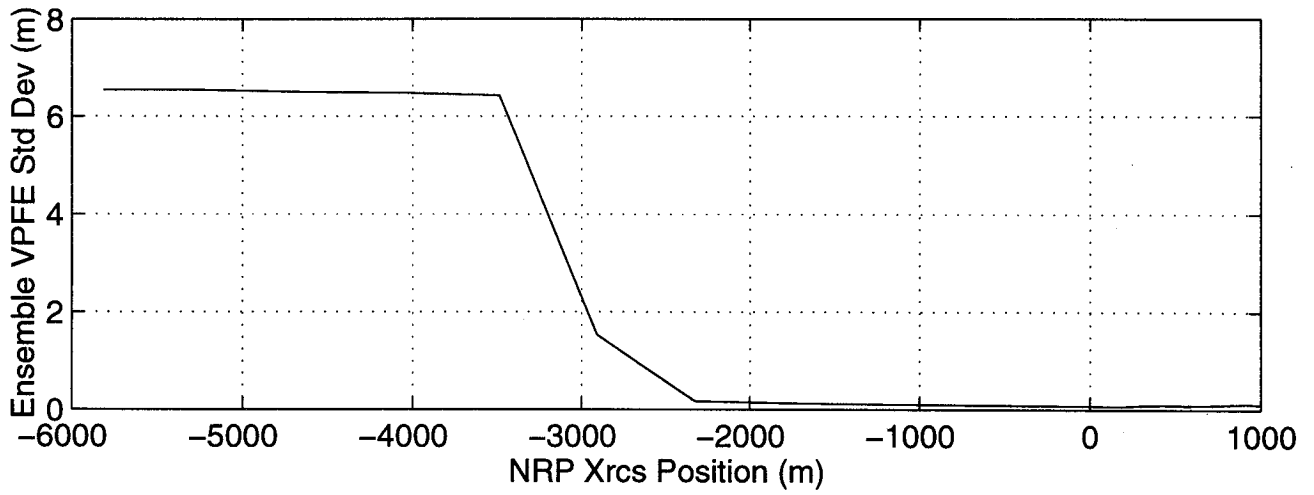
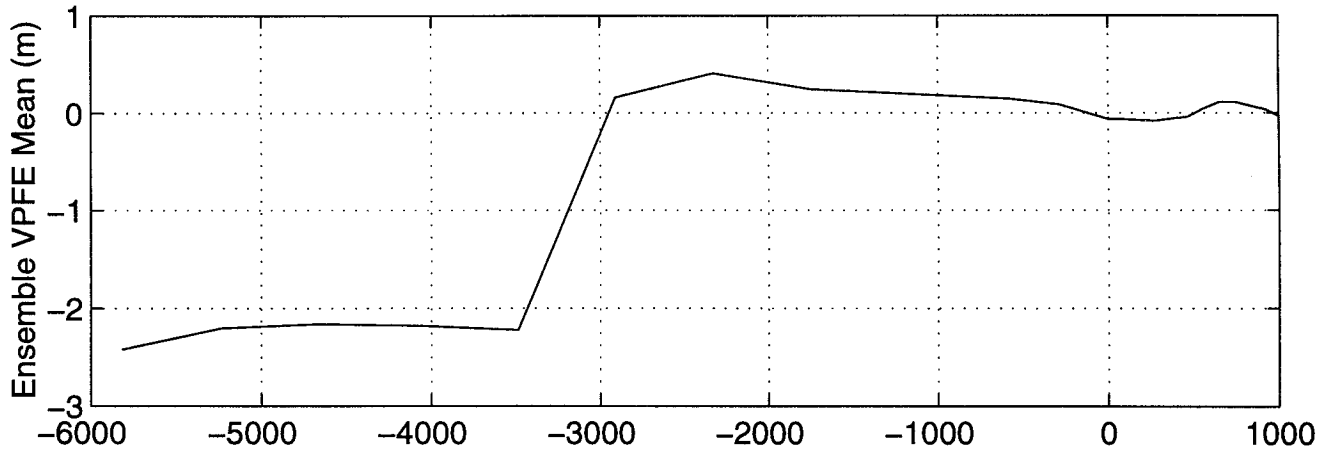
ENSEMBLE LAT CONTROL MOTION NOISE STATISTICS FOR ALL VALID APPROACHES



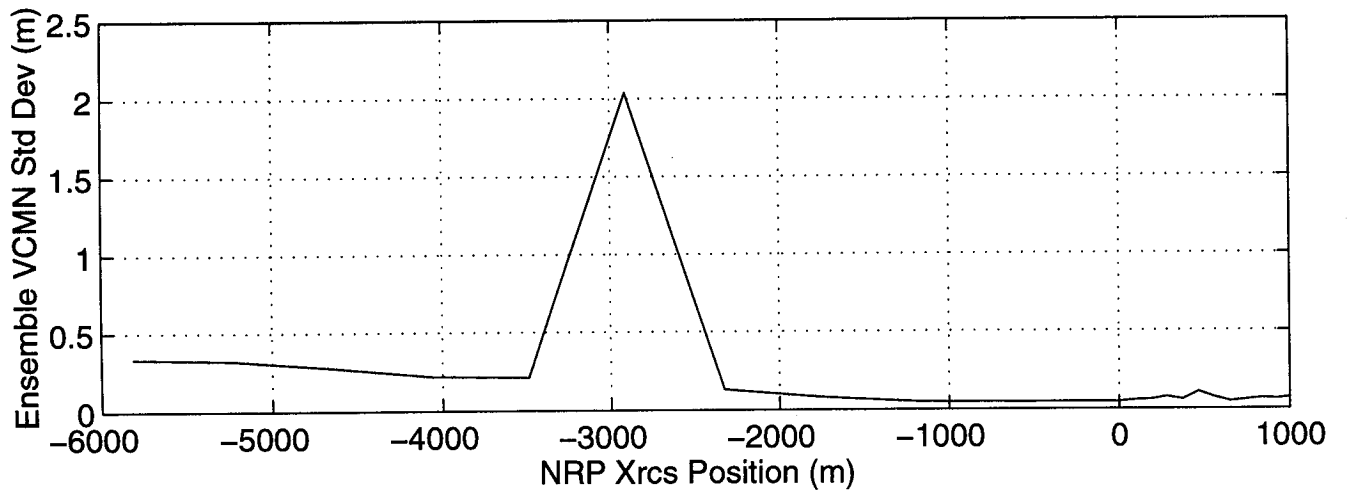
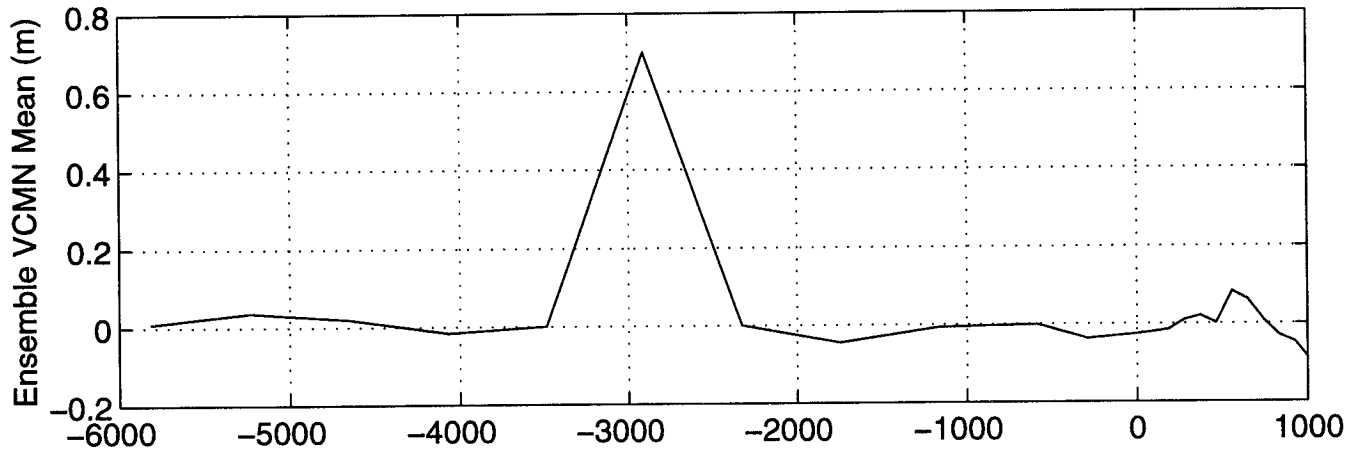
ENSEMBLE UVE MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES



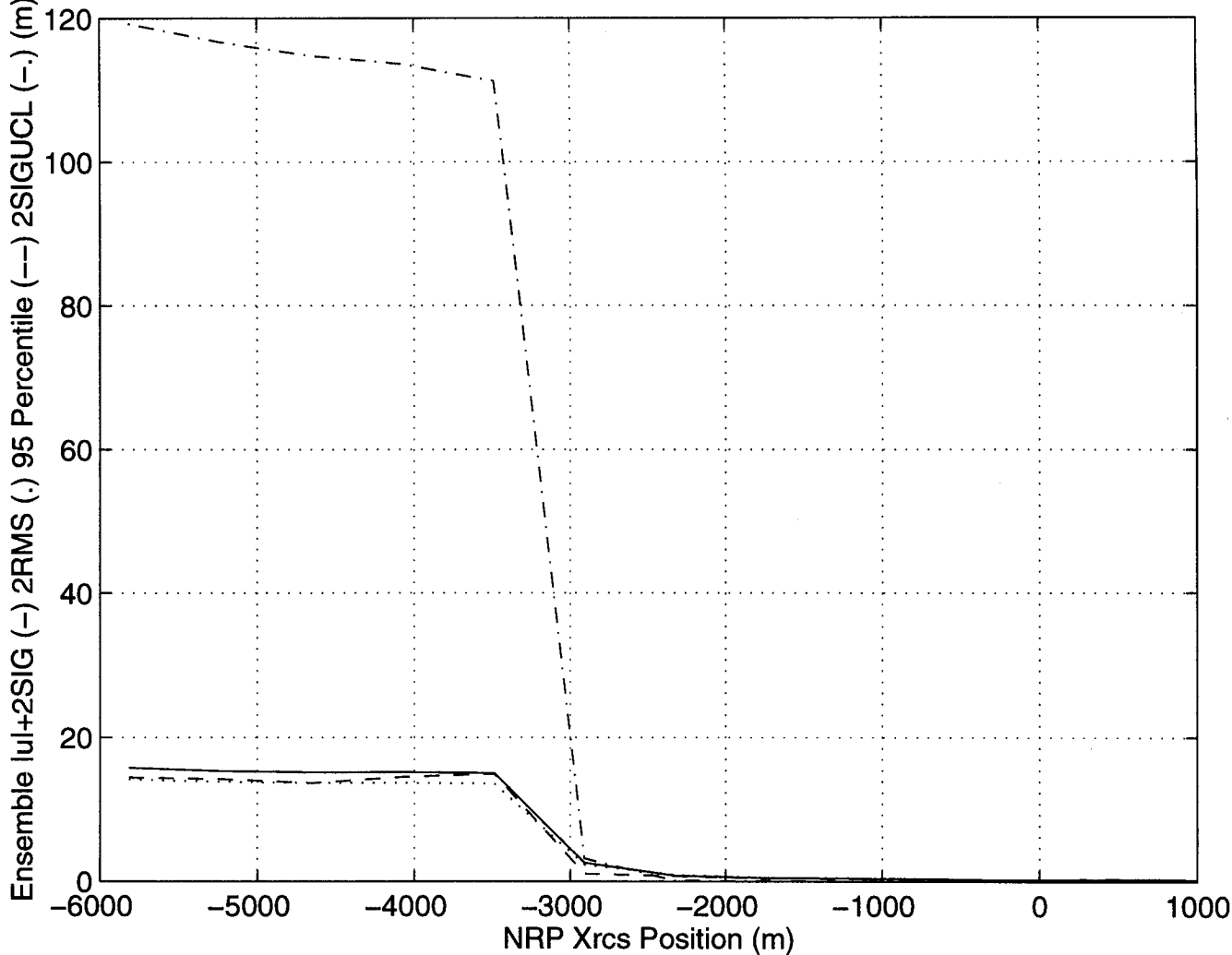
ENSEMBLE VPFE MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES



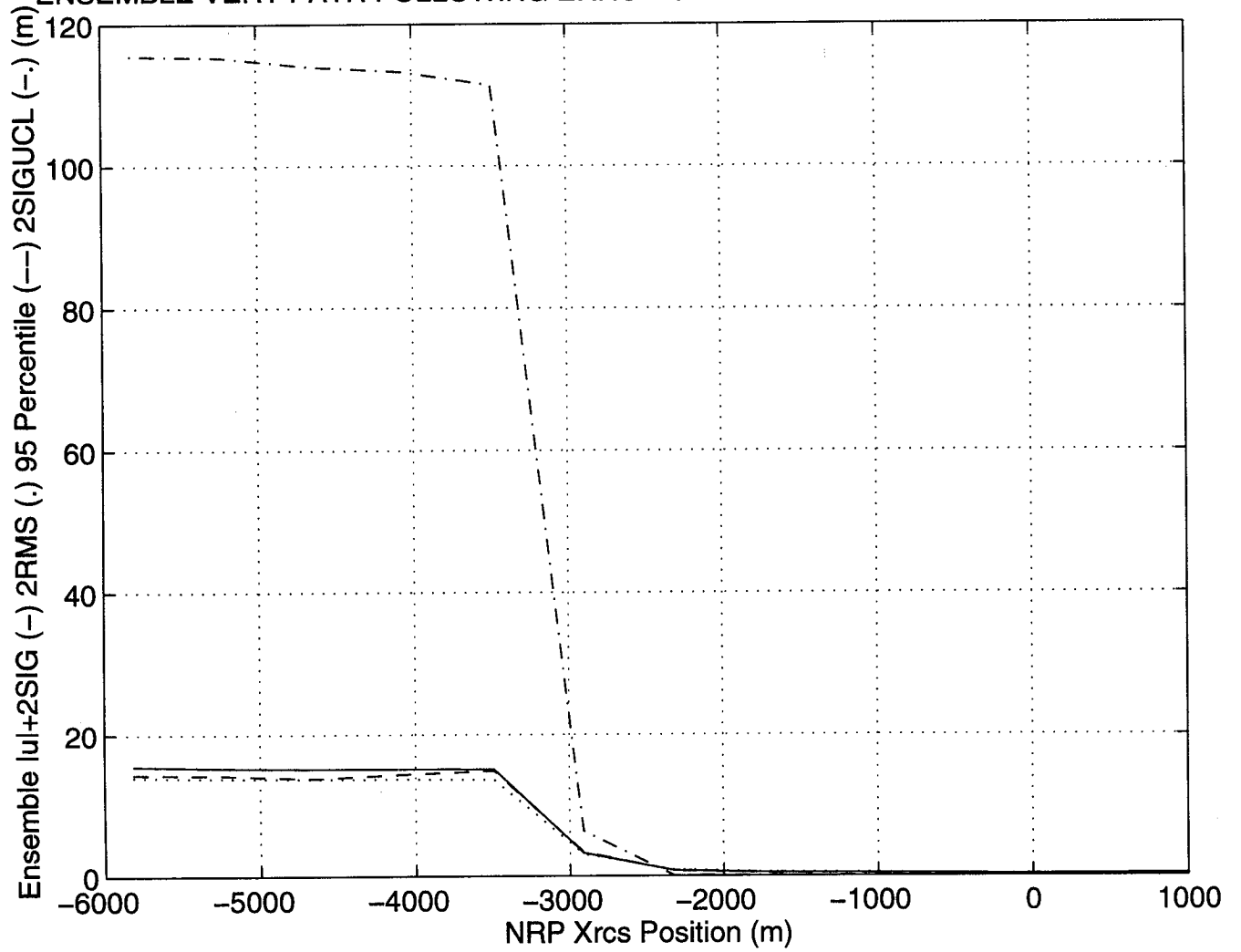
ENSEMBLE VCMN MEAN AND STANDARD DEVIATION FOR ALL VALID APPROACHES



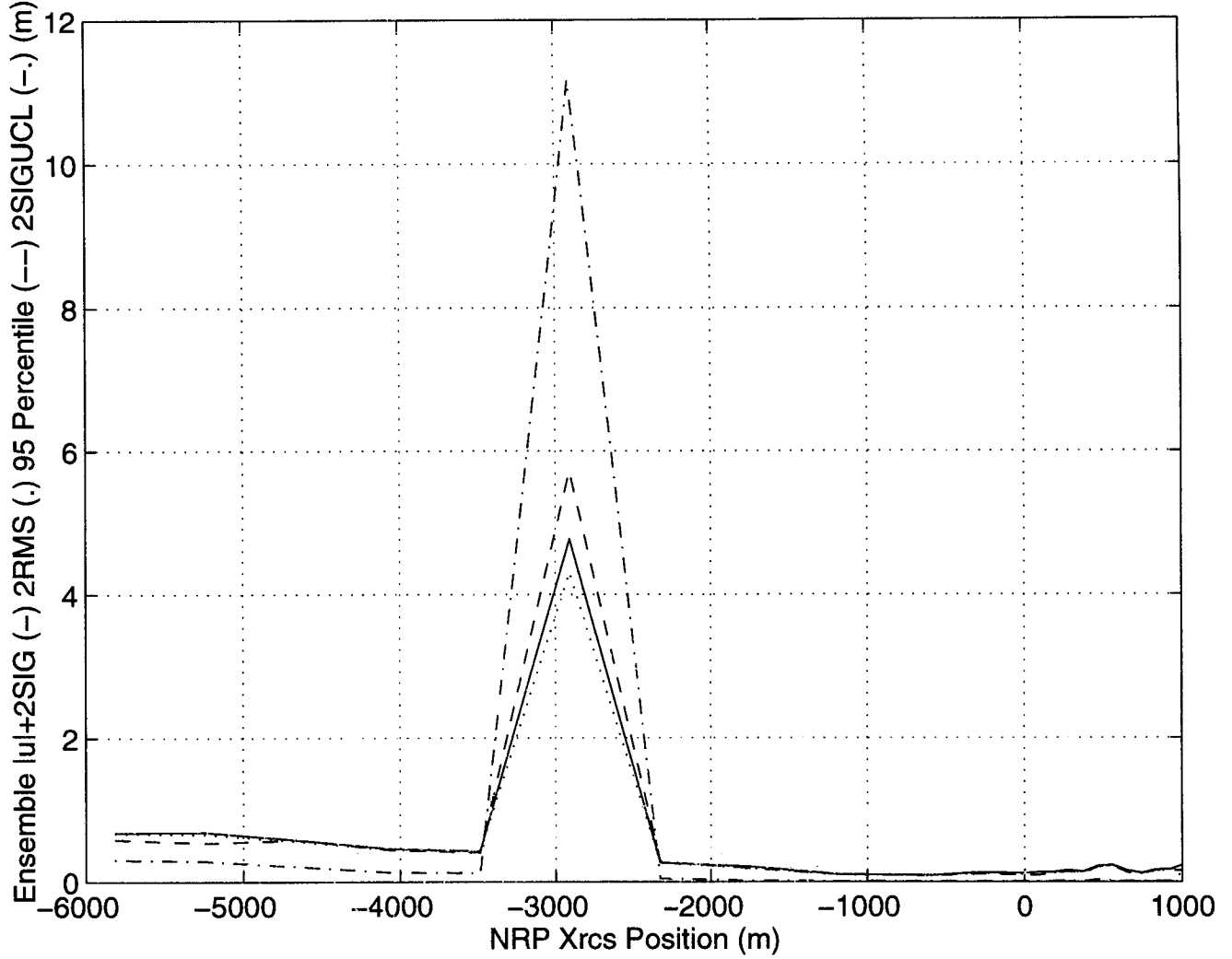
ENSEMBLE UNFILTERED VERTICAL ERROR STATISTICS FOR ALL VALID APPROACHES



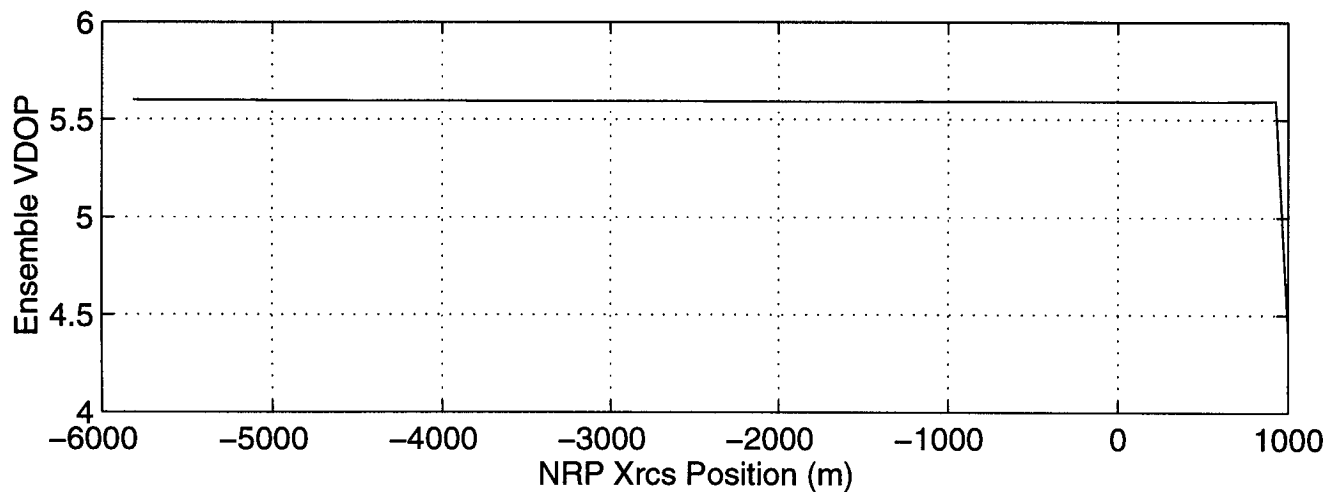
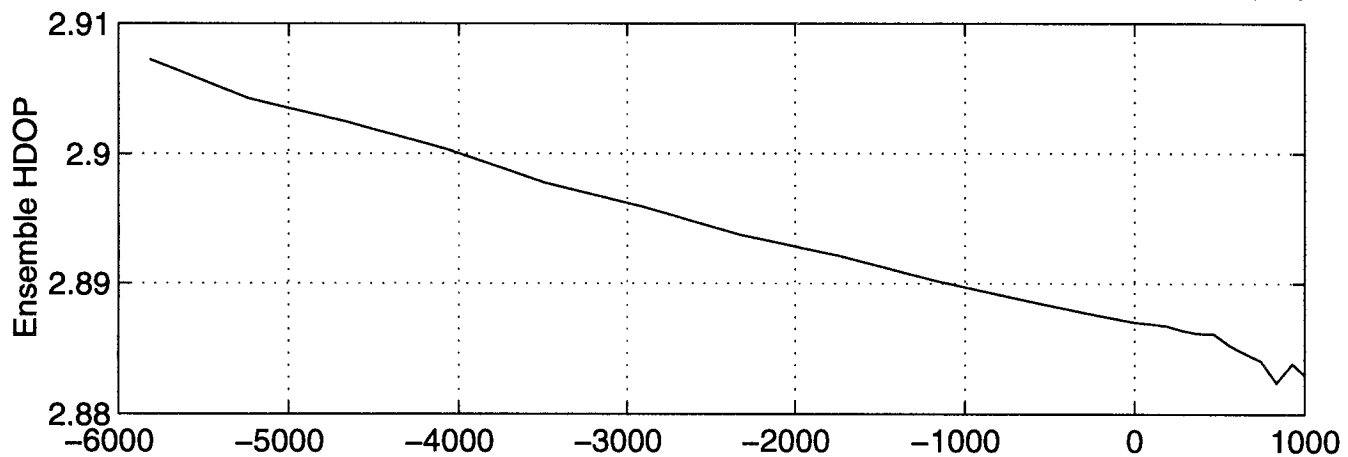
ENSEMBLE VERT PATH FOLLOWING ERROR STATISTICS FOR ALL VALID APPROACHES



ENSEMBLE VERT CONTROL MOTION NOISE STATISTICS FOR ALL VALID APPROACHES



ENSEMBLE MEAN HDOP AND VDOP FOR ALL VALID AND SUCCESSFUL APPROACHES



APPENDIX C

INDIVIDUAL APPROACH AND AUTOLANDING RESULTS

**INTENTIONALLY
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BLANK**

APPROACH #: SU428408
START TIME: 236360.999
STOP TIME: 236466.999

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.0
MAXIMUM VDOP: 4.1
AVERAGE VDOP: 4.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.225
NRP Yrcs MEAN DIFFERENCE (m): -0.106
NRP Zrcs MEAN DIFFERENCE (m): 0.160

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.271
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.376
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.249

NRP Xrcs 2-RMS DIFFERENCE (m): 0.524
NRP Yrcs 2-RMS DIFFERENCE (m): 0.432
NRP Zrcs 2-RMS DIFFERENCE (m): 0.406

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 128.944
LGRP Yrcs POSITION (m): 2.949

APPROACH #: SU428408
START TIME: 236360.999
STOP TIME: 236466.999

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.0
MAXIMUM VDOP: 4.1
AVERAGE VDOP: 4.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

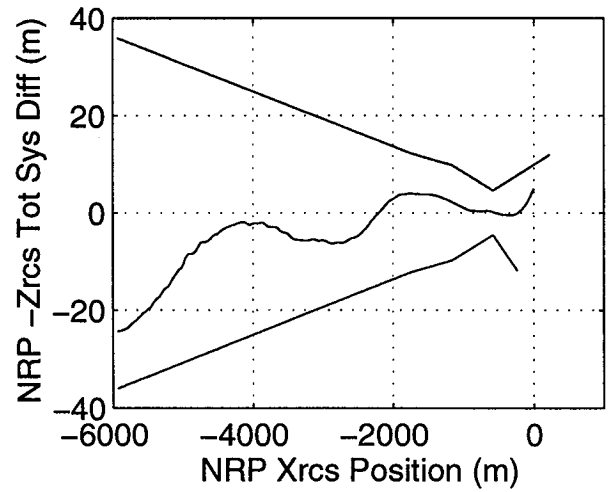
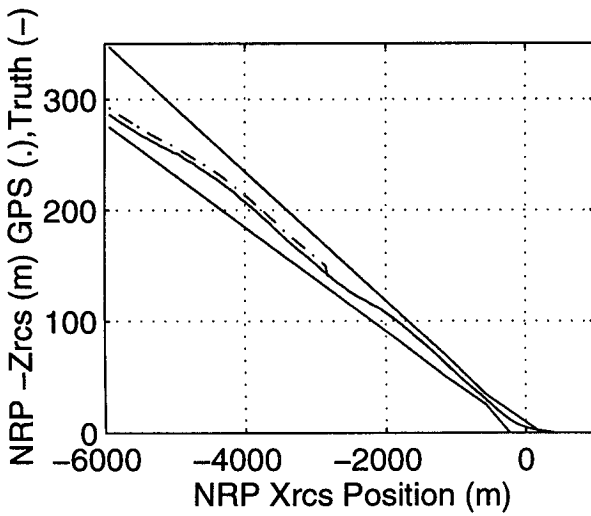
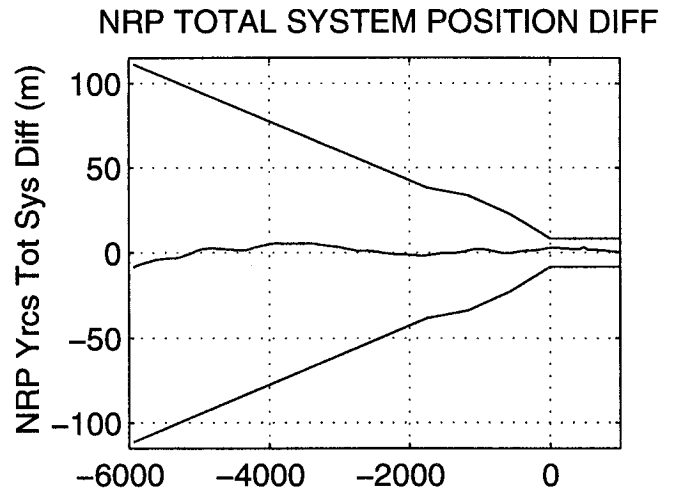
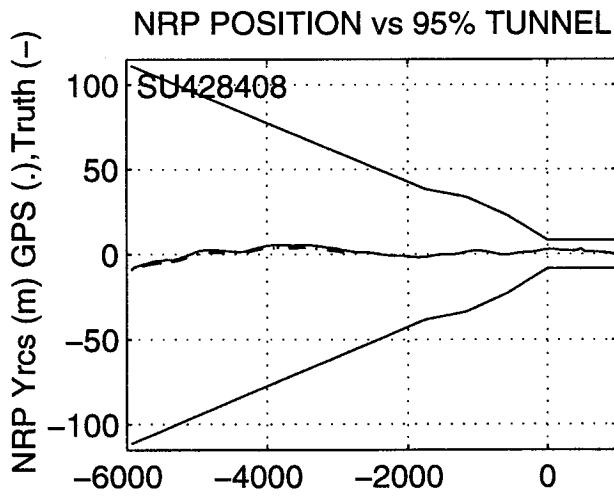
NRP Xrcs MEAN DIFFERENCE (m): 0.225
NRP Yrcs MEAN DIFFERENCE (m): -0.106
NRP Zrcs MEAN DIFFERENCE (m): 0.160

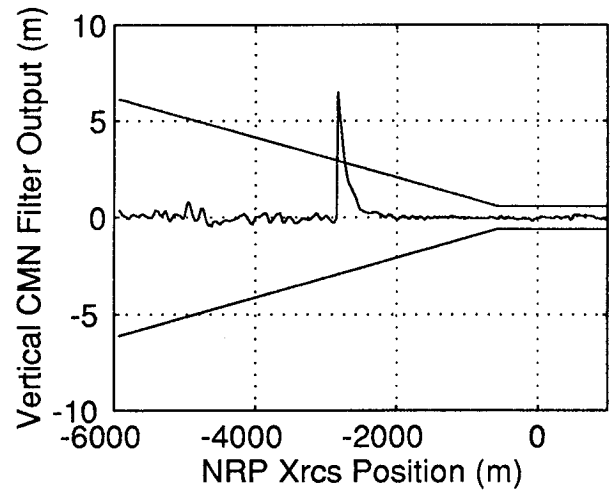
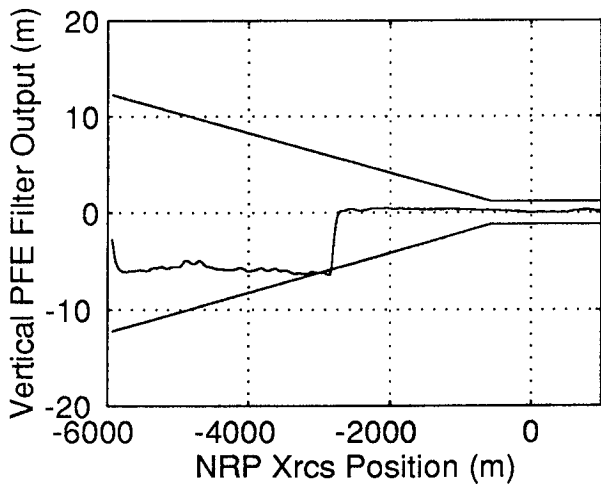
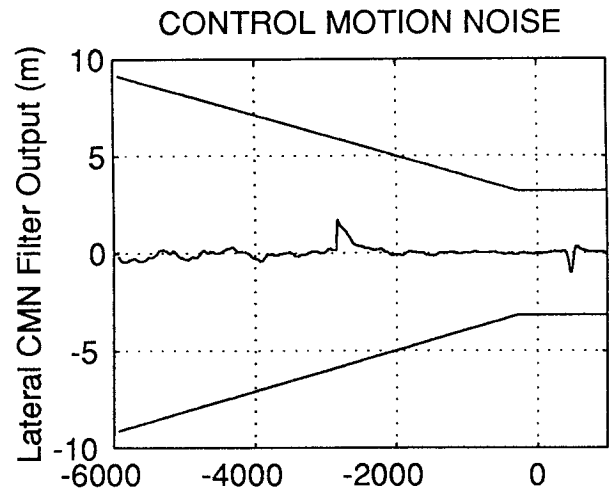
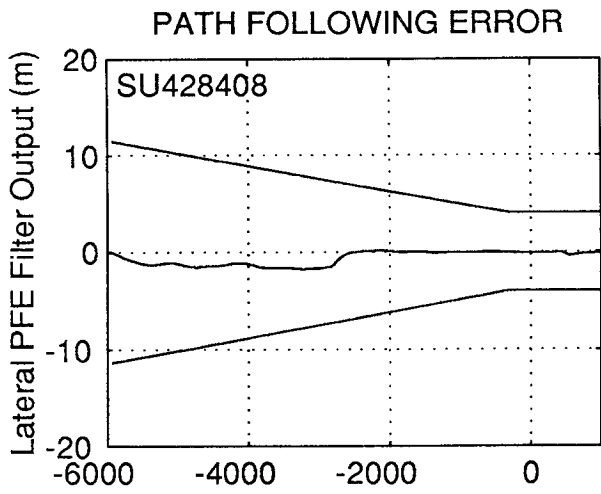
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.271
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.376
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.249

NRP Xrcs 2-RMS DIFFERENCE (m): 0.524
NRP Yrcs 2-RMS DIFFERENCE (m): 0.432
NRP Zrcs 2-RMS DIFFERENCE (m): 0.406

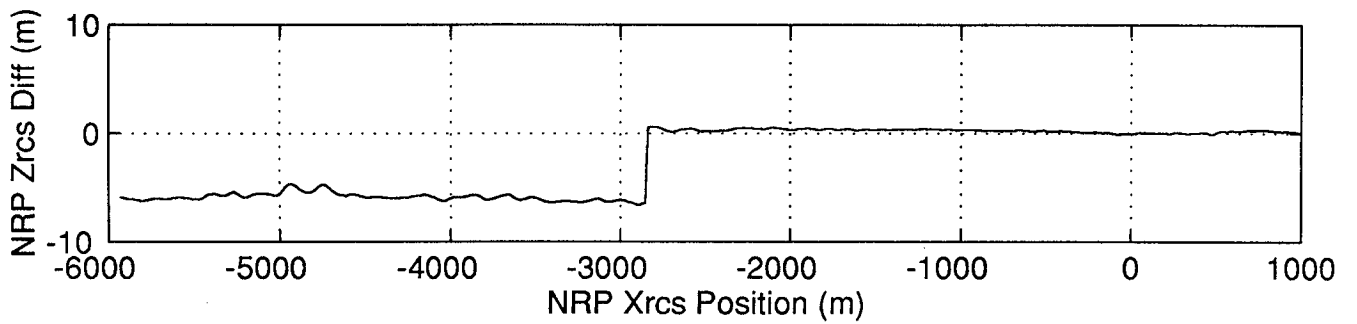
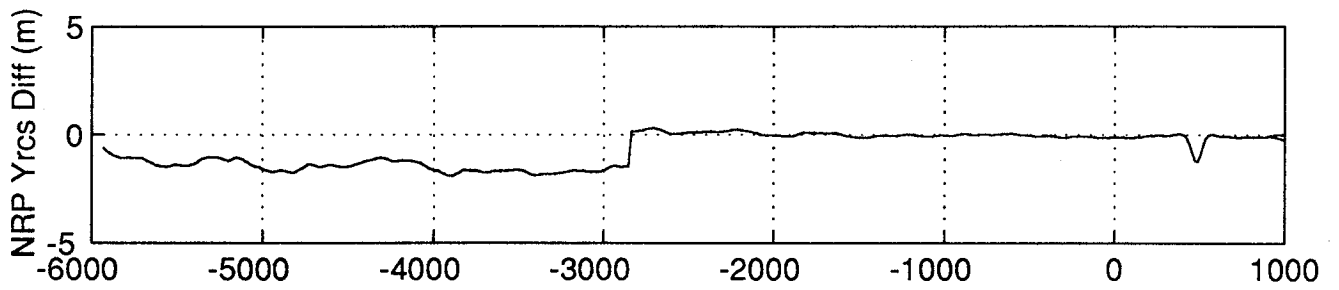
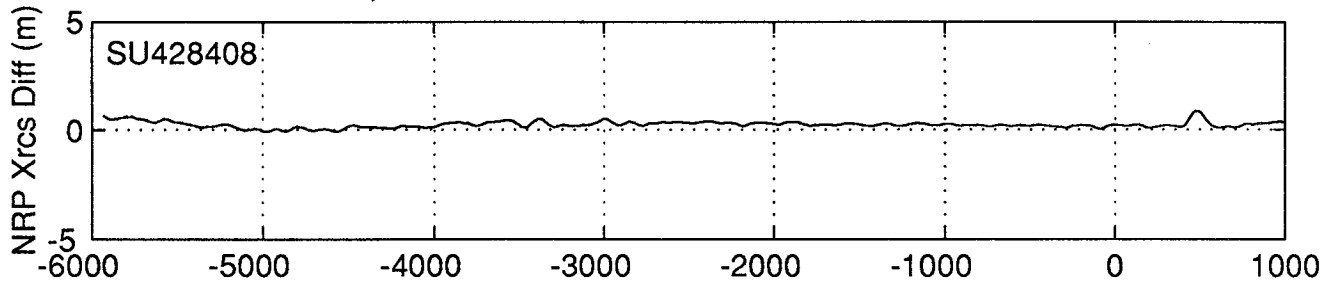
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 128.944
LGRP Yrcs POSITION (m): 2.949





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428410
START TIME: 237055.749
STOP TIME: 237163.249

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.6
MAXIMUM VDOP: 3.6
AVERAGE VDOP: 3.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.499
NRP Yrcs MEAN DIFFERENCE (m): -0.052
NRP Zrcs MEAN DIFFERENCE (m): 0.130

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.292
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.221
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.237

NRP Xrcs 2-RMS DIFFERENCE (m): 1.040
NRP Yrcs 2-RMS DIFFERENCE (m): 0.244
NRP Zrcs 2-RMS DIFFERENCE (m): 0.351

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 101.453
LGRP Yrcs POSITION (m): -0.294

APPROACH #: SU428410
START TIME: 237055.749
STOP TIME: 237163.249

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.6
MAXIMUM VDOP: 3.6
AVERAGE VDOP: 3.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

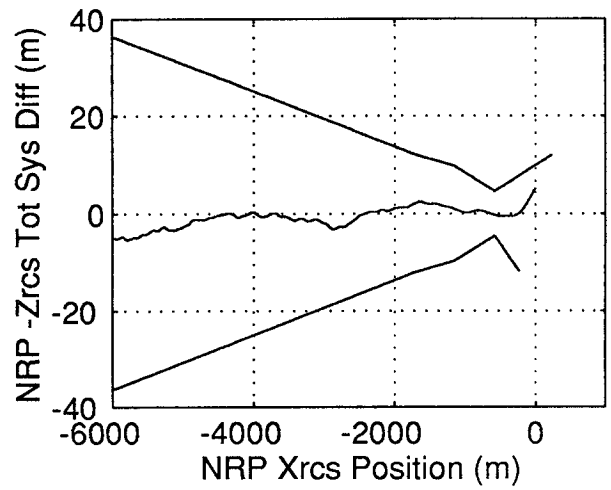
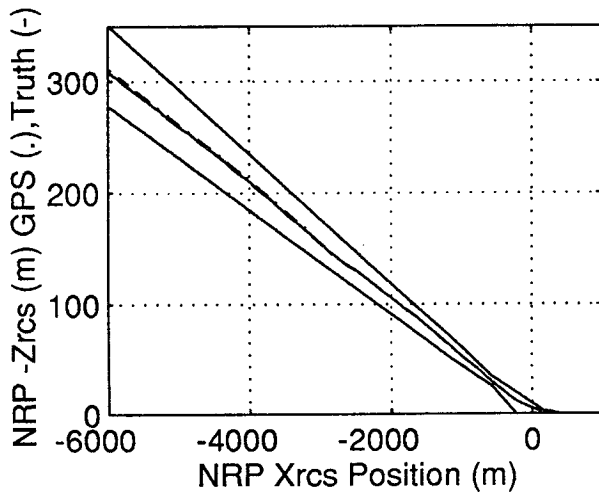
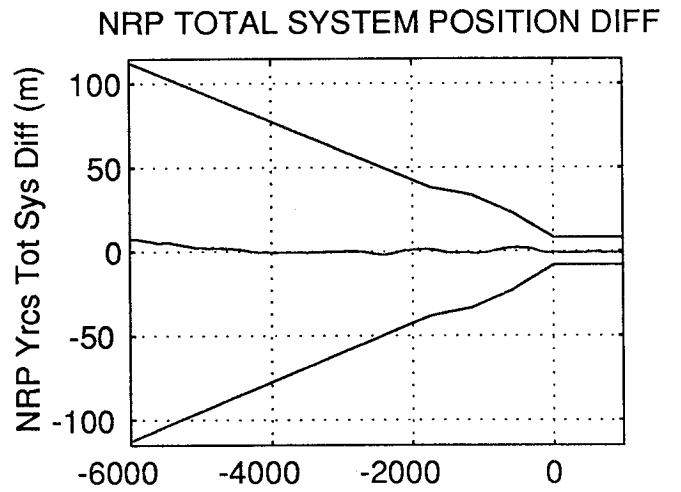
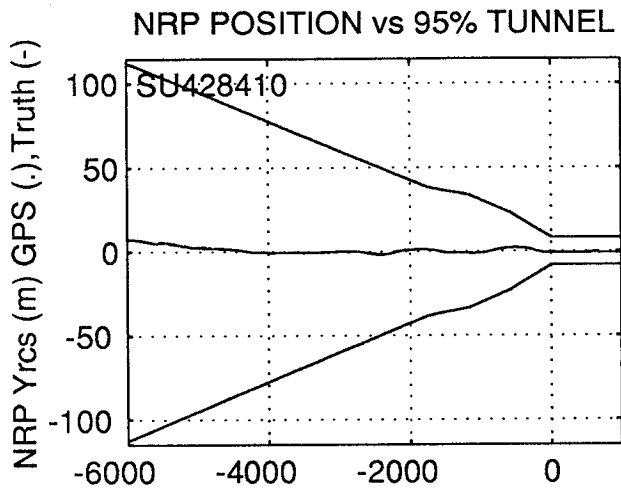
NRP Xrcs MEAN DIFFERENCE (m): 0.499
NRP Yrcs MEAN DIFFERENCE (m): -0.052
NRP Zrcs MEAN DIFFERENCE (m): 0.130

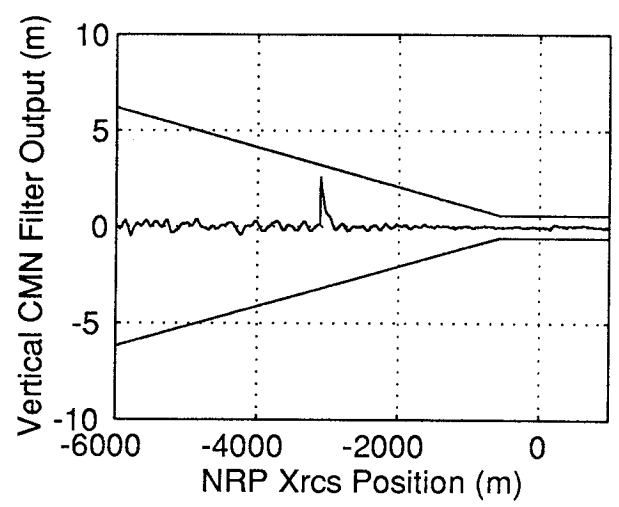
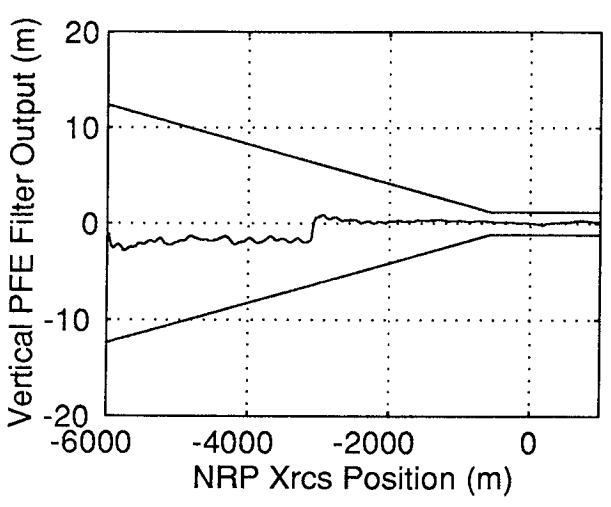
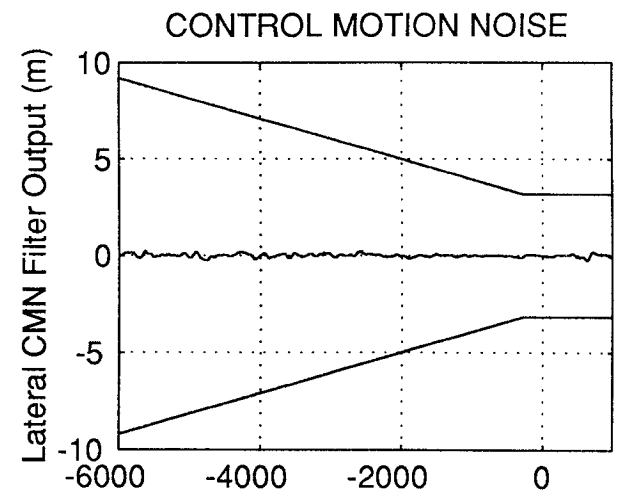
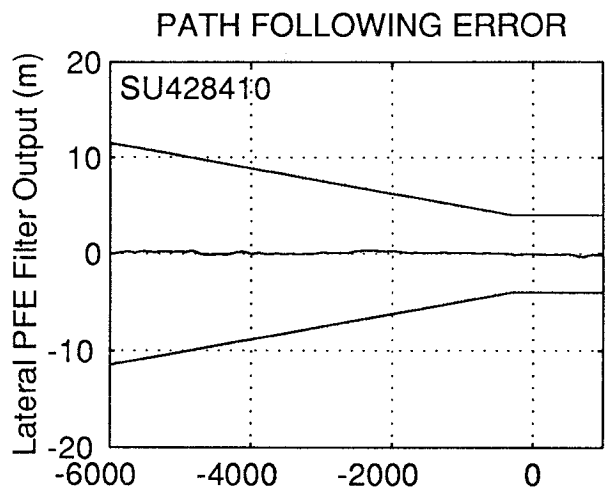
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.292
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.221
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.237

NRP Xrcs 2-RMS DIFFERENCE (m): 1.040
NRP Yrcs 2-RMS DIFFERENCE (m): 0.244
NRP Zrcs 2-RMS DIFFERENCE (m): 0.351

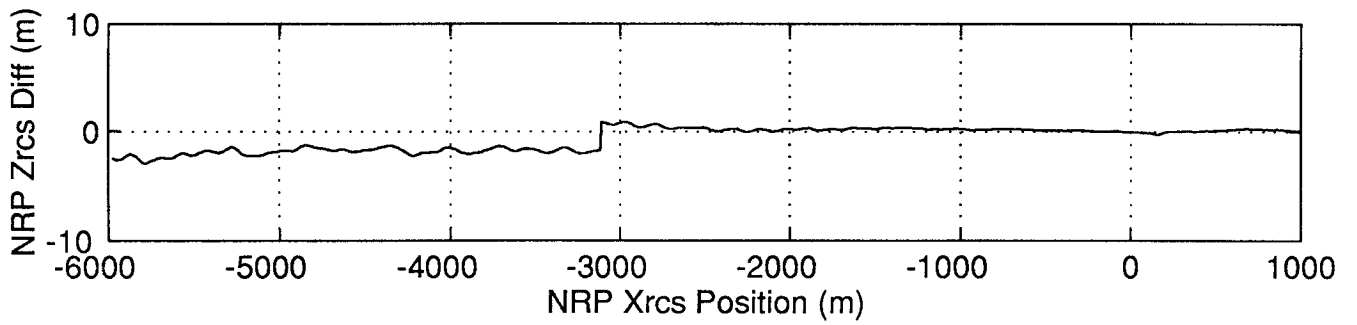
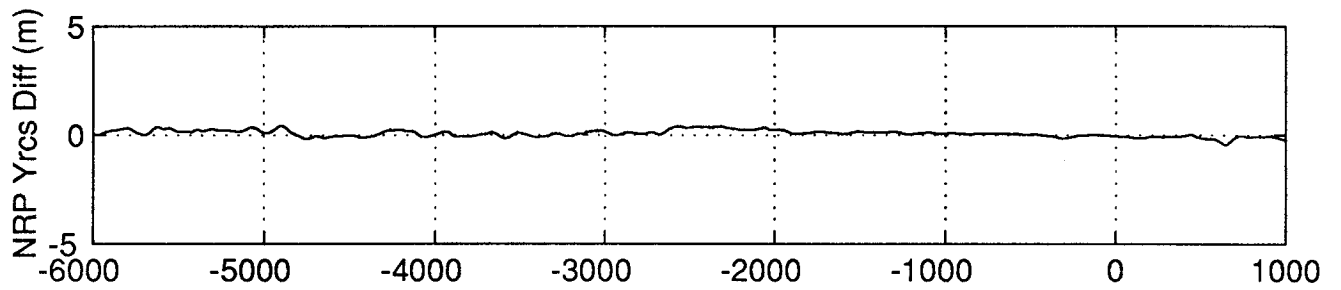
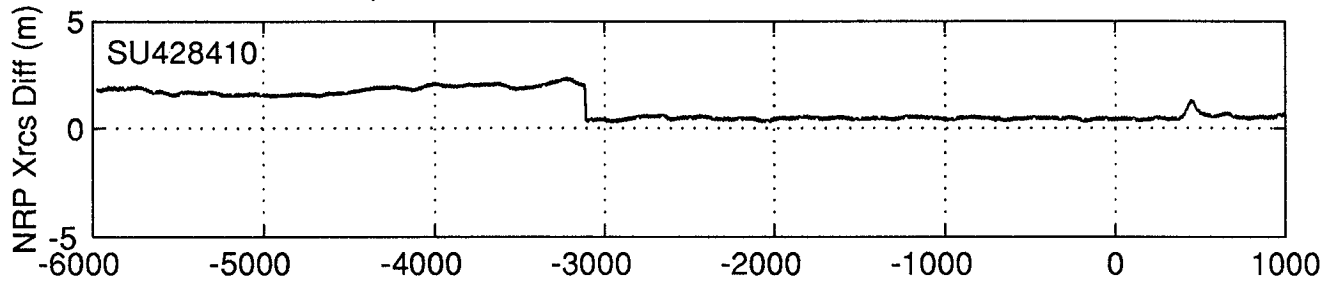
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 101.453
LGRP Yrcs POSITION (m): -0.294





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428412
START TIME: 237524.749
STOP TIME: 237633.749

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.4
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.433
NRP Yrcs MEAN DIFFERENCE (m): -0.098
NRP Zrcs MEAN DIFFERENCE (m): 0.059

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.173
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.259
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.241

NRP Xrcs 2-RMS DIFFERENCE (m): 0.884
NRP Yrcs 2-RMS DIFFERENCE (m): 0.325
NRP Zrcs 2-RMS DIFFERENCE (m): 0.268

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 111.325
LGRP Yrcs POSITION (m): 2.476

APPROACH #: SU428412
START TIME: 237524.749
STOP TIME: 237633.749

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.4
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

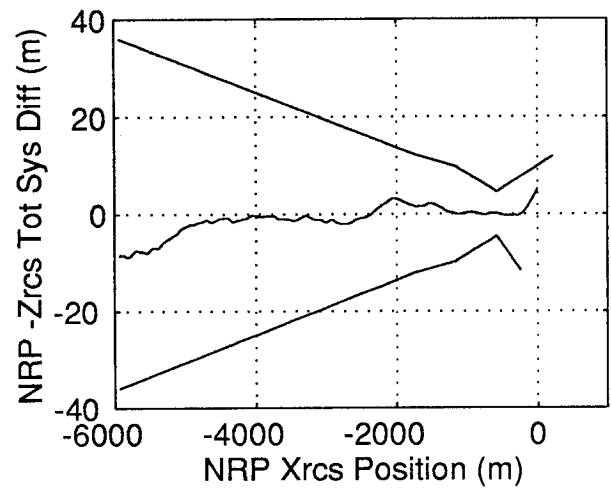
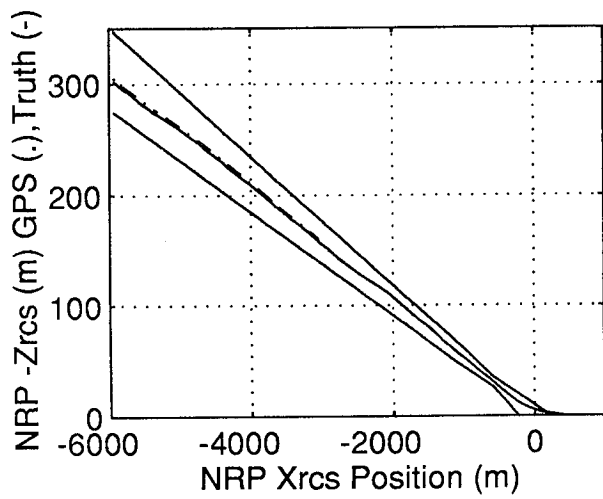
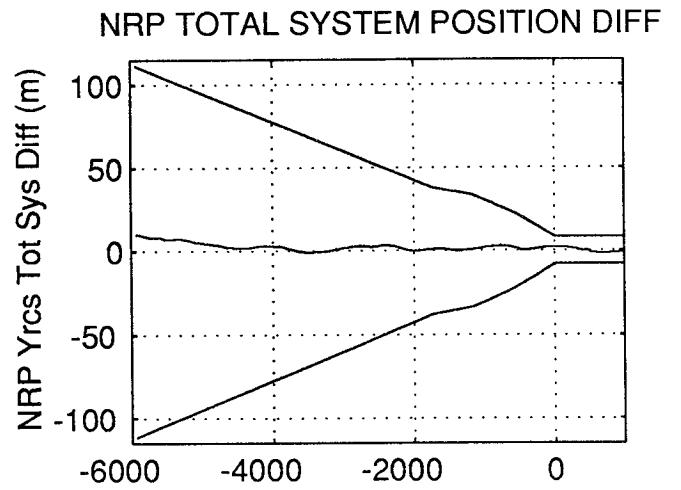
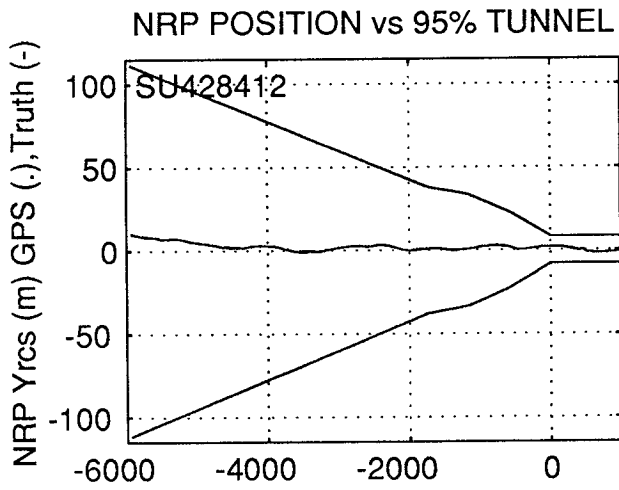
NRP Xrcs MEAN DIFFERENCE (m): 0.433
NRP Yrcs MEAN DIFFERENCE (m): -0.098
NRP Zrcs MEAN DIFFERENCE (m): 0.059

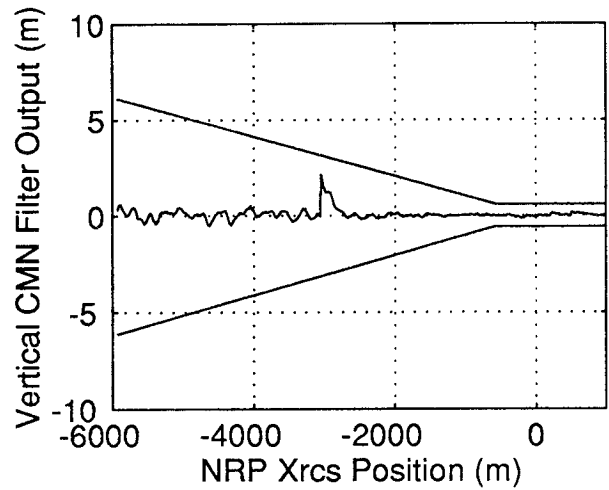
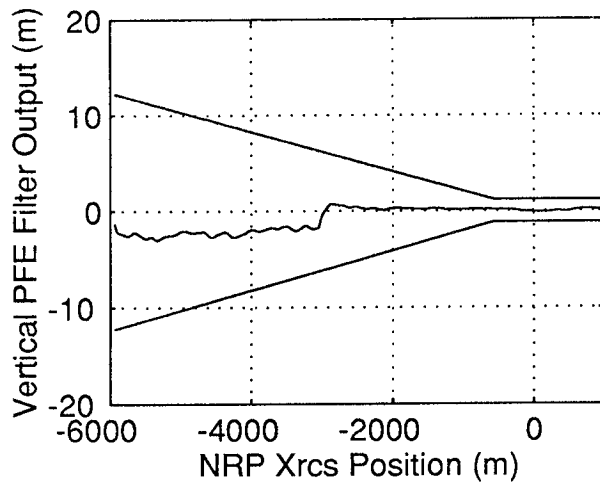
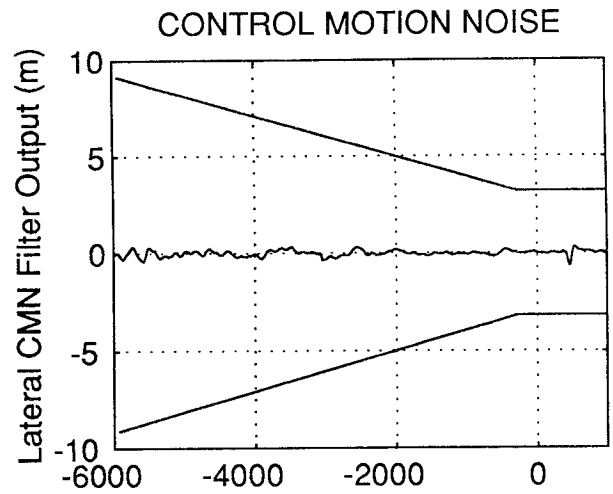
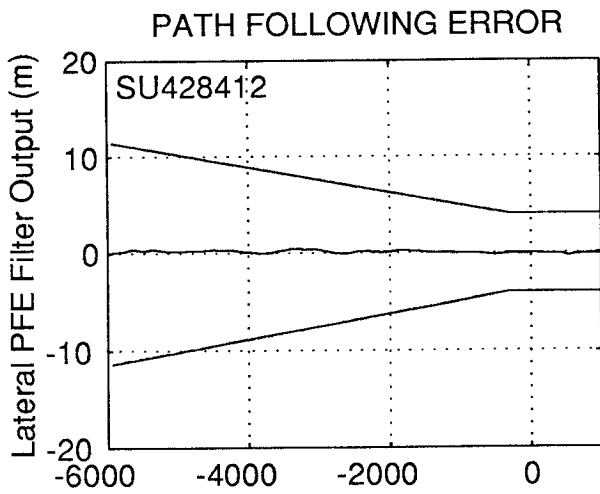
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.173
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.259
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.241

NRP Xrcs 2-RMS DIFFERENCE (m): 0.884
NRP Yrcs 2-RMS DIFFERENCE (m): 0.325
NRP Zrcs 2-RMS DIFFERENCE (m): 0.268

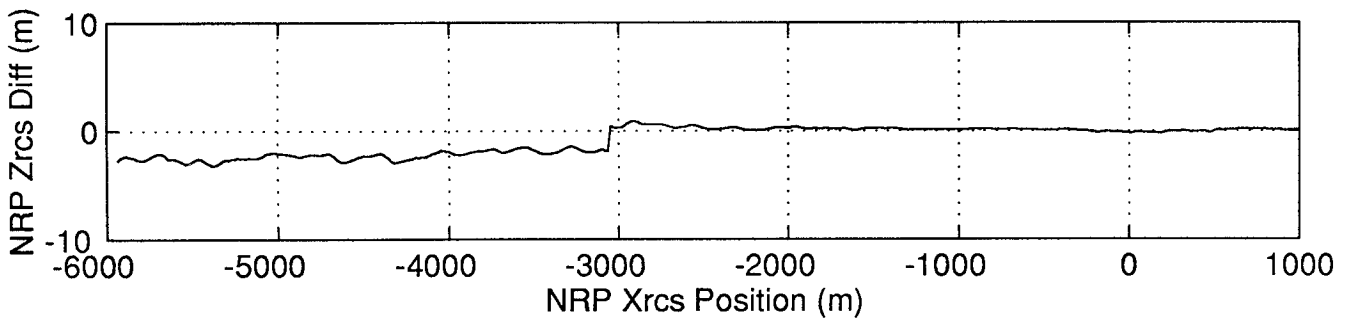
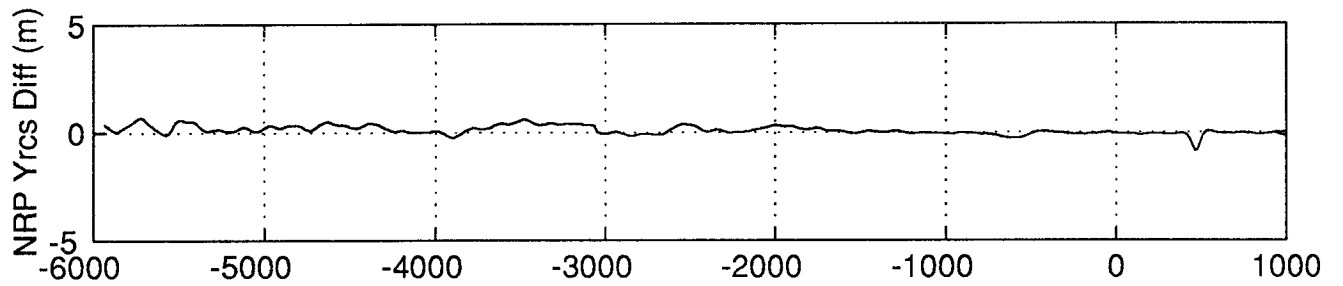
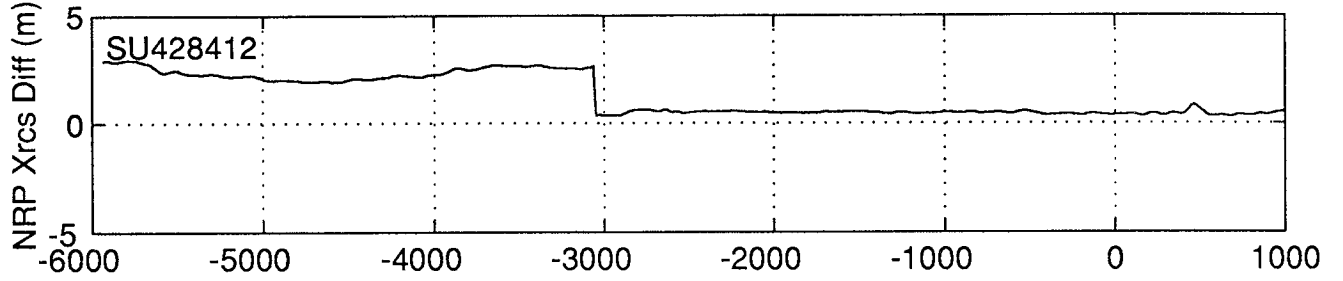
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 111.325
LGRP Yrcs POSITION (m): 2.476





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428414
START TIME: 237954.749
STOP TIME: 238064.249

APPROACH #: SU428414
START TIME: 237954.749
STOP TIME: 238064.249

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 4.4
MAXIMUM VDOP: 4.5
AVERAGE VDOP: 4.5

MINIMUM VDOP: 4.4
MAXIMUM VDOP: 4.5
AVERAGE VDOP: 4.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.471
NRP Yrcs MEAN DIFFERENCE (m): -0.134
NRP Zrcs MEAN DIFFERENCE (m): 0.067

NRP Xrcs MEAN DIFFERENCE (m): 0.471
NRP Yrcs MEAN DIFFERENCE (m): -0.134
NRP Zrcs MEAN DIFFERENCE (m): 0.067

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.439
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.252

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.439
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.252

NRP Xrcs 2-RMS DIFFERENCE (m): 1.038
NRP Yrcs 2-RMS DIFFERENCE (m): 0.333
NRP Zrcs 2-RMS DIFFERENCE (m): 0.285

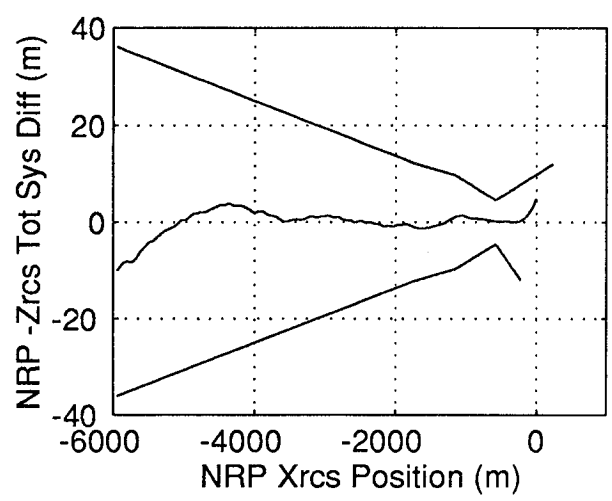
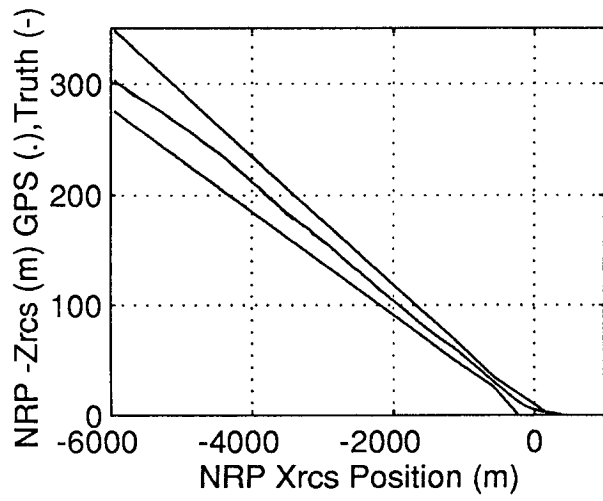
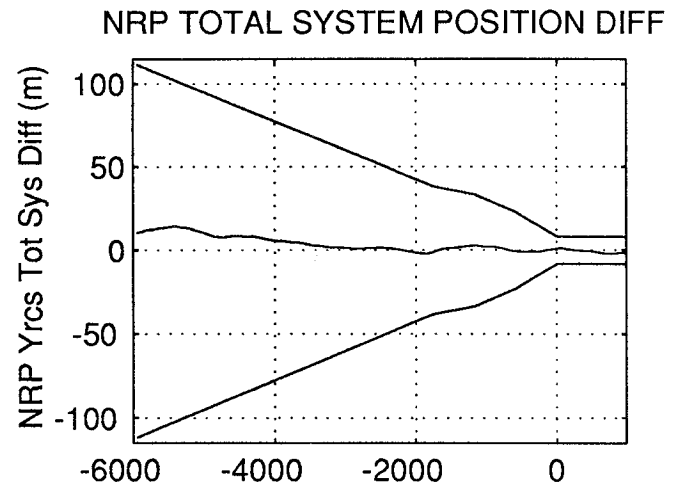
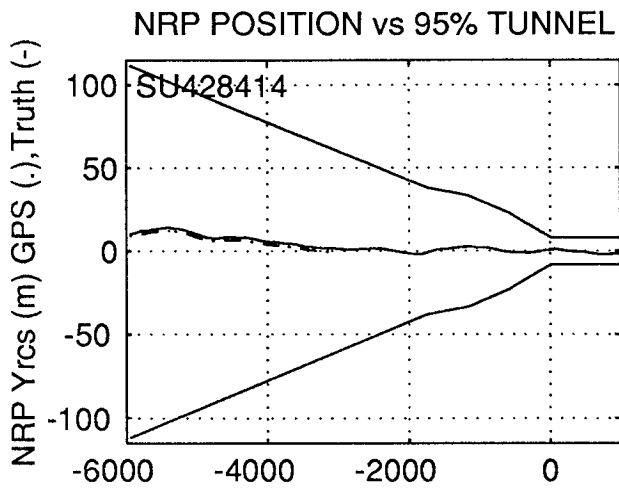
NRP Xrcs 2-RMS DIFFERENCE (m): 1.038
NRP Yrcs 2-RMS DIFFERENCE (m): 0.333
NRP Zrcs 2-RMS DIFFERENCE (m): 0.285

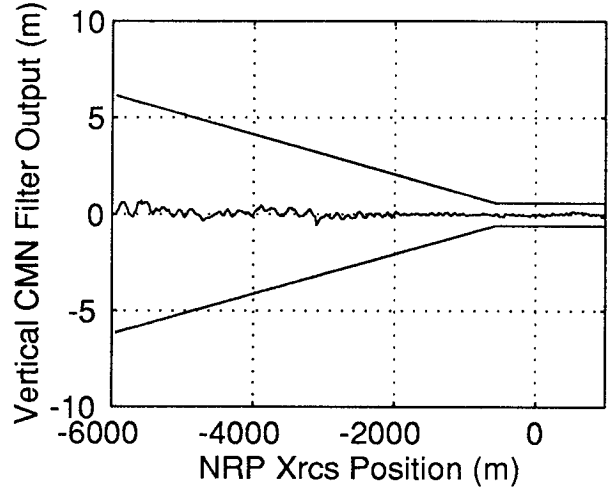
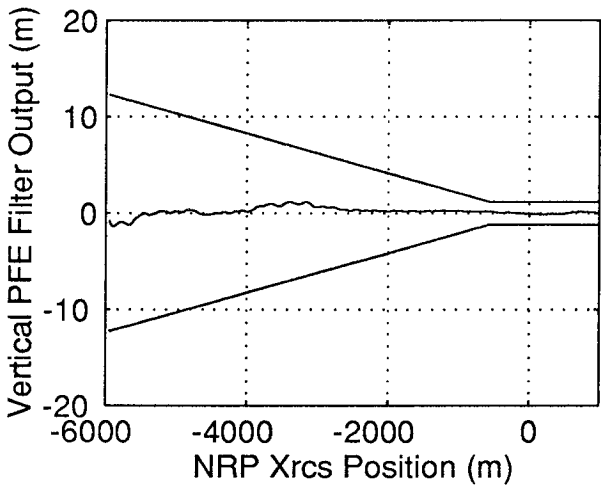
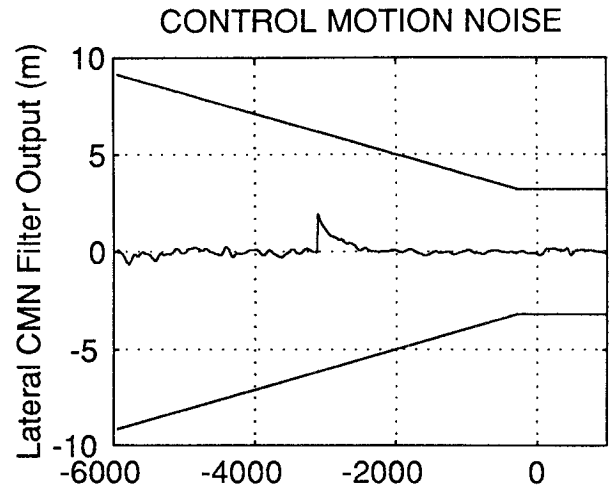
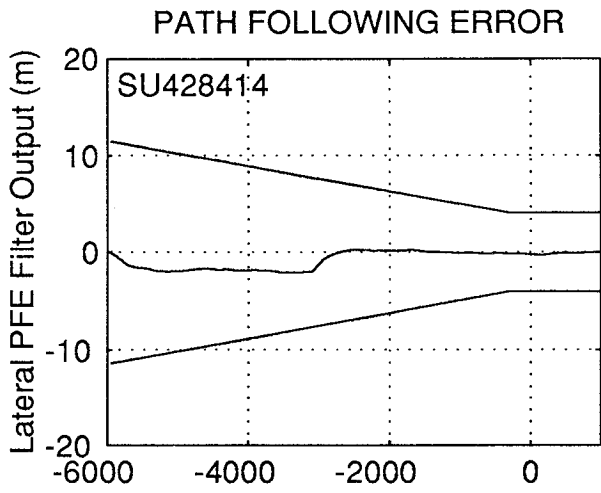
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

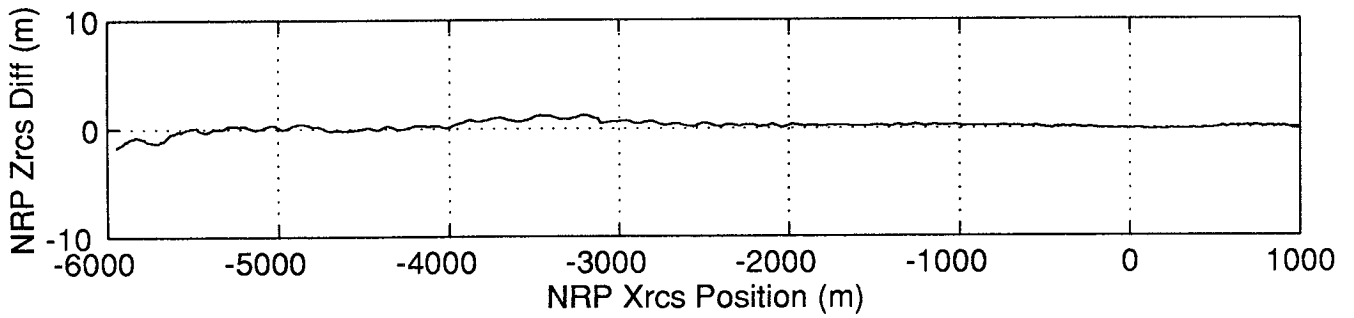
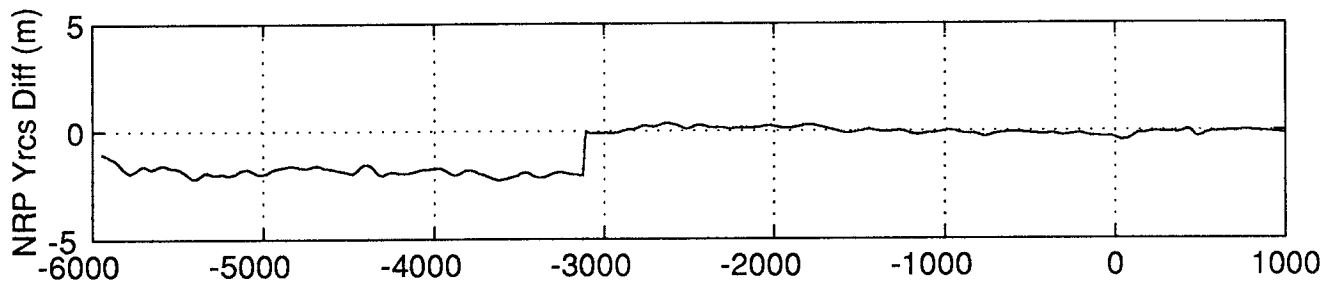
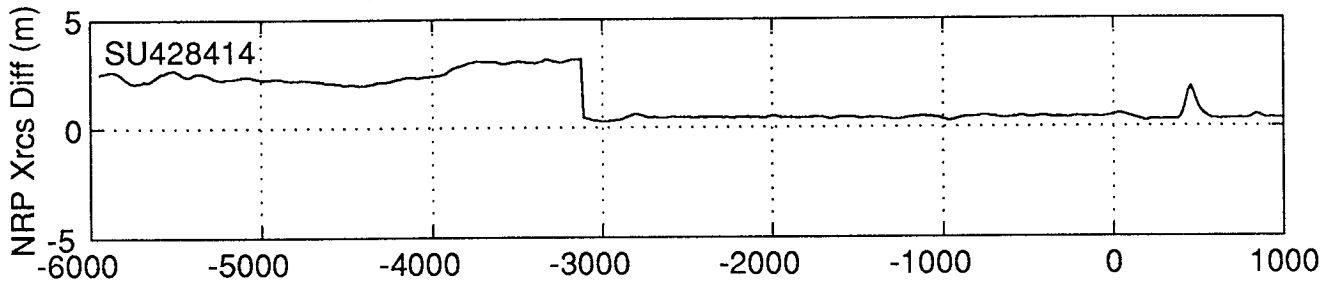
LGRP Xrcs POSITION (m): 136.297
LGRP Yrcs POSITION (m): 0.907

LGRP Xrcs POSITION (m): 136.297
LGRP Yrcs POSITION (m): 0.907





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428416
START TIME: 238374.499
STOP TIME: 238482.749

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.7
MAXIMUM VDOP: 4.8
AVERAGE VDOP: 4.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.456
NRP Yrcs MEAN DIFFERENCE (m): -0.095
NRP Zrcs MEAN DIFFERENCE (m): 0.098

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.277
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.098
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.262

NRP Xrcs 2-RMS DIFFERENCE (m): 0.953
NRP Yrcs 2-RMS DIFFERENCE (m): 0.214
NRP Zrcs 2-RMS DIFFERENCE (m): 0.327

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 108.756
LGRP Yrcs POSITION (m): -2.461

APPROACH #: SU428416
START TIME: 238374.499
STOP TIME: 238482.749

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.7
MAXIMUM VDOP: 4.8
AVERAGE VDOP: 4.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

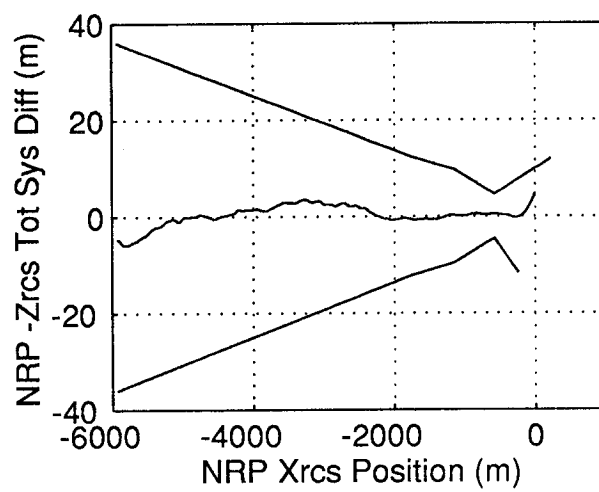
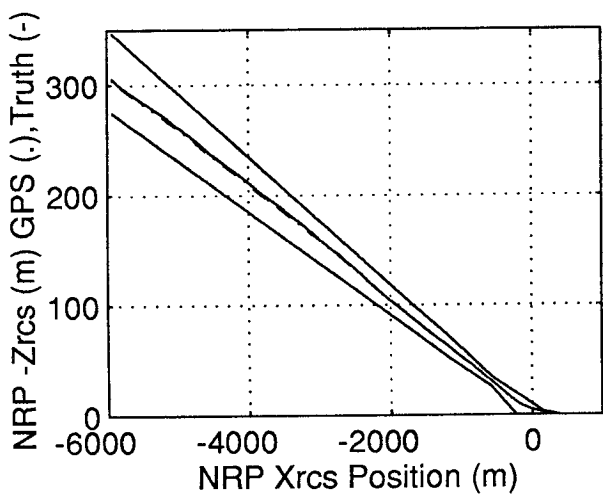
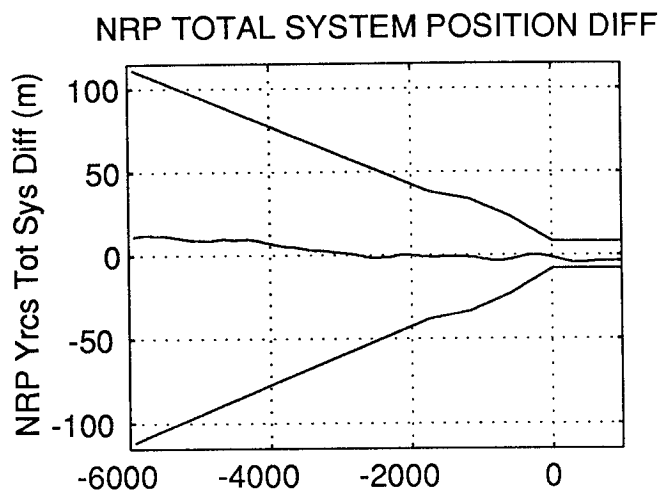
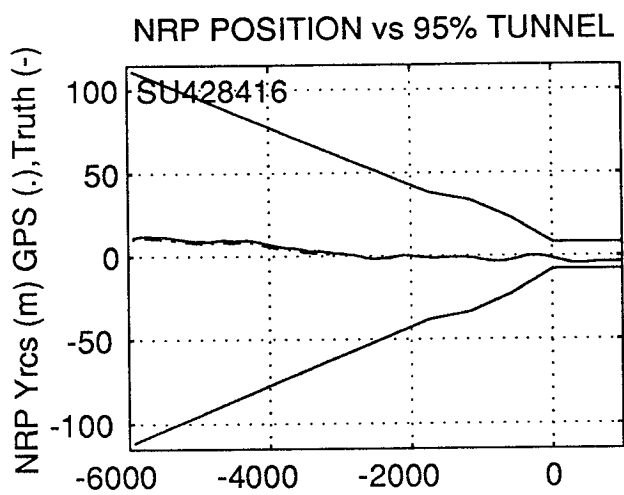
NRP Xrcs MEAN DIFFERENCE (m): 0.456
NRP Yrcs MEAN DIFFERENCE (m): -0.095
NRP Zrcs MEAN DIFFERENCE (m): 0.098

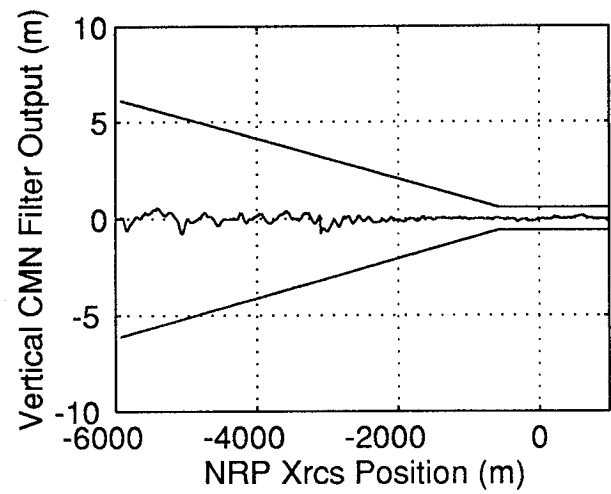
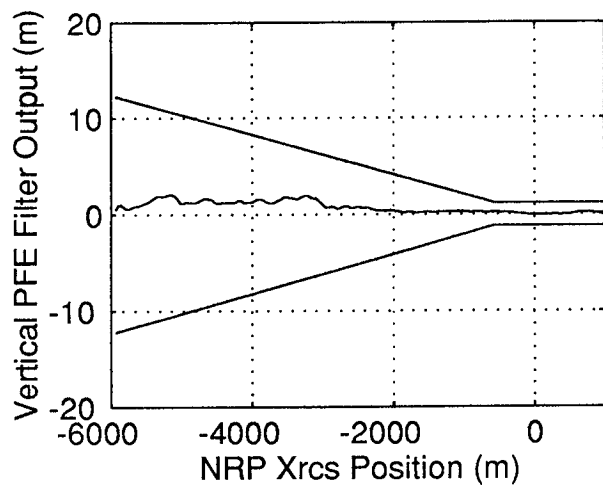
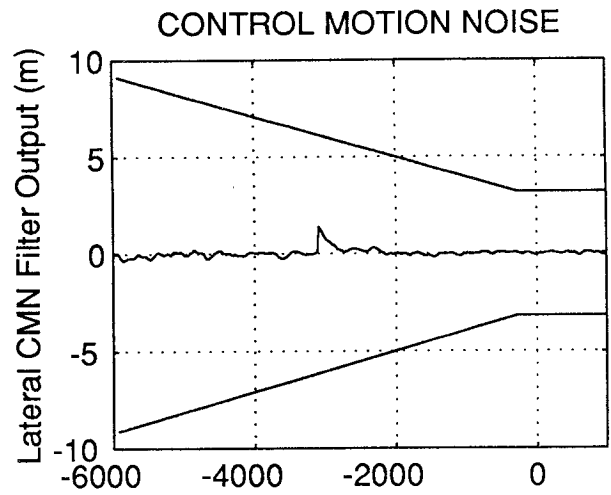
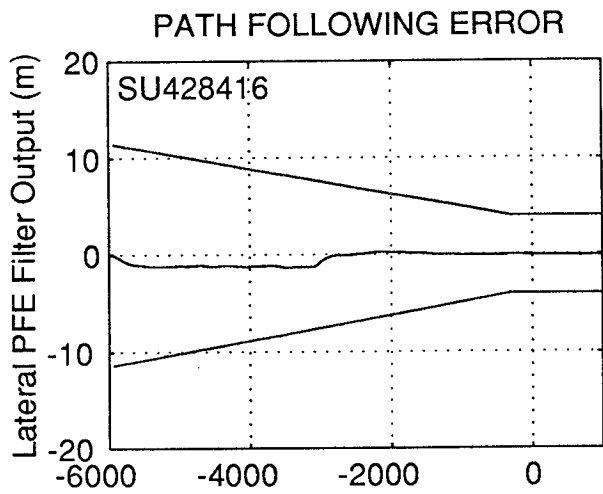
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.277
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.098
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.262

NRP Xrcs 2-RMS DIFFERENCE (m): 0.953
NRP Yrcs 2-RMS DIFFERENCE (m): 0.214
NRP Zrcs 2-RMS DIFFERENCE (m): 0.327

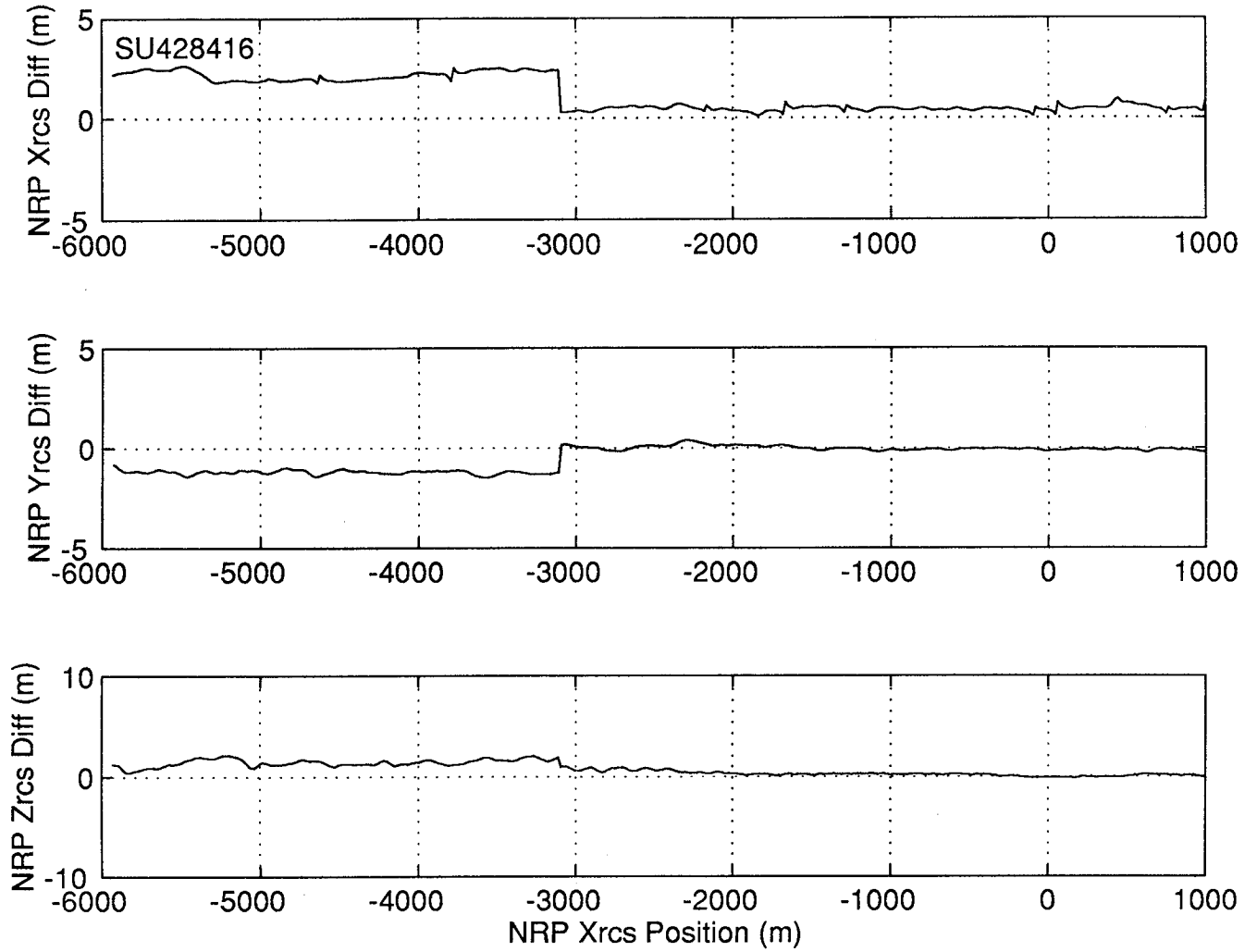
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 108.756
LGRP Yrcs POSITION (m): -2.461





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428418
START TIME: 238819.749
STOP TIME: 238929.249

MINIMUM HDOP: 2.6
MAXIMUM HDOP: 2.6
AVERAGE HDOP: 2.6

MINIMUM VDOP: 5.1
MAXIMUM VDOP: 5.2
AVERAGE VDOP: 5.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.642
NRP Yrcs MEAN DIFFERENCE (m): -0.534
NRP Zrcs MEAN DIFFERENCE (m): 0.083

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.589
NRP Yrcs 2-SIGMA DIFFERENCE (m): 1.522
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.266

NRP Xrcs 2-RMS DIFFERENCE (m): 1.413
NRP Yrcs 2-RMS DIFFERENCE (m): 1.859
NRP Zrcs 2-RMS DIFFERENCE (m): 0.313

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.172
LGRP Yrcs POSITION (m): 0.038

APPROACH #: SU428418
START TIME: 238819.749
STOP TIME: 238929.249

MINIMUM HDOP: 2.6
MAXIMUM HDOP: 2.6
AVERAGE HDOP: 2.6

MINIMUM VDOP: 5.1
MAXIMUM VDOP: 5.2
AVERAGE VDOP: 5.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

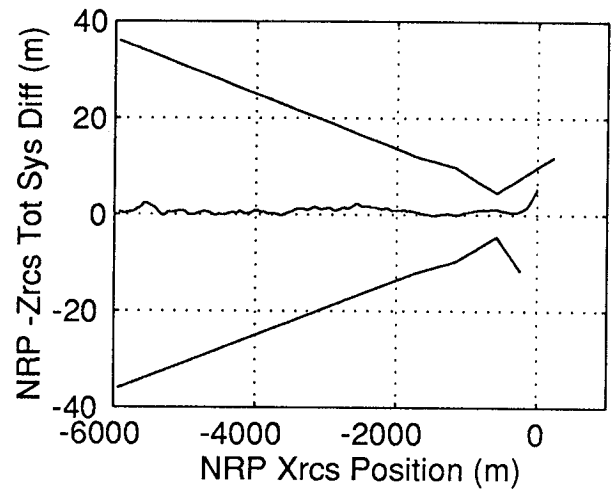
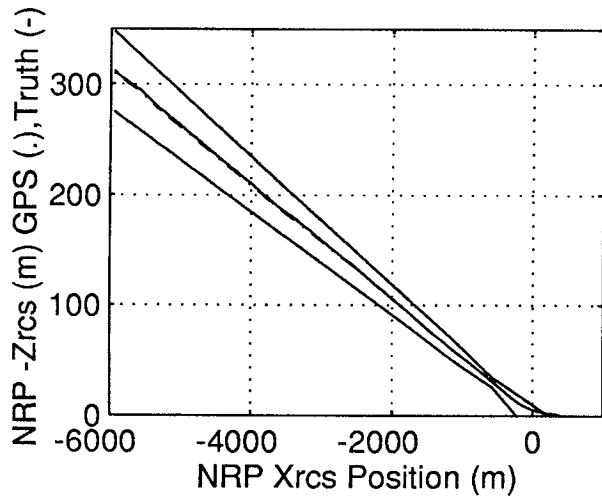
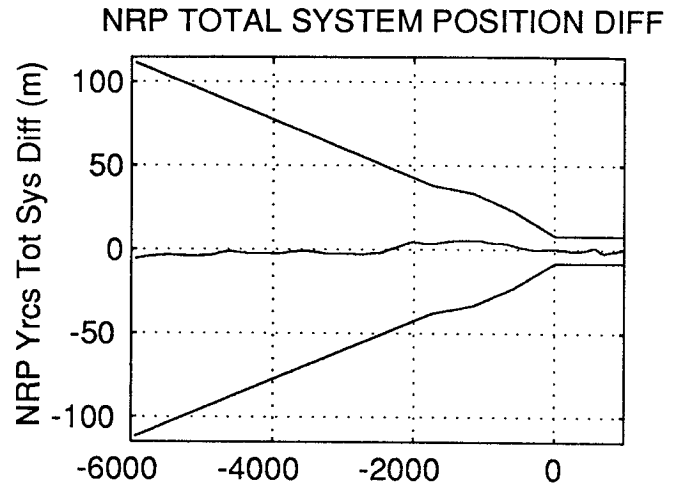
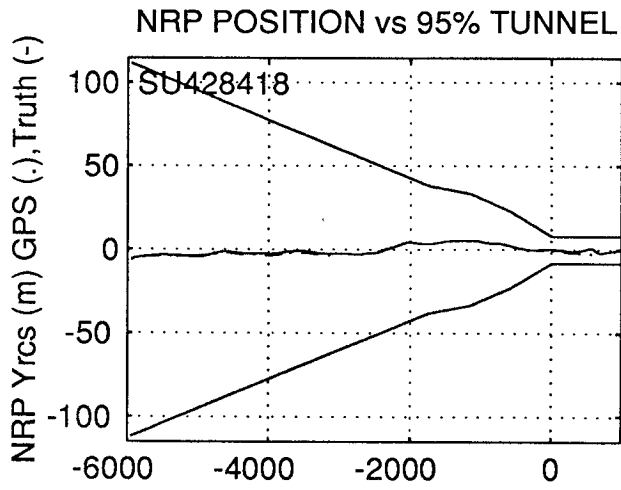
NRP Xrcs MEAN DIFFERENCE (m): 0.642
NRP Yrcs MEAN DIFFERENCE (m): -0.534
NRP Zrcs MEAN DIFFERENCE (m): 0.083

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.589
NRP Yrcs 2-SIGMA DIFFERENCE (m): 1.522
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.266

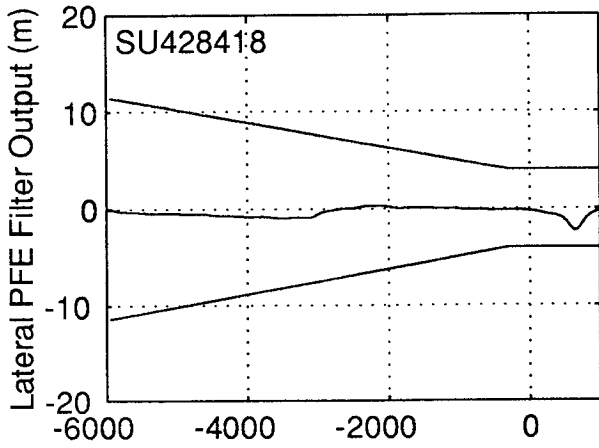
NRP Xrcs 2-RMS DIFFERENCE (m): 1.413
NRP Yrcs 2-RMS DIFFERENCE (m): 1.859
NRP Zrcs 2-RMS DIFFERENCE (m): 0.313

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

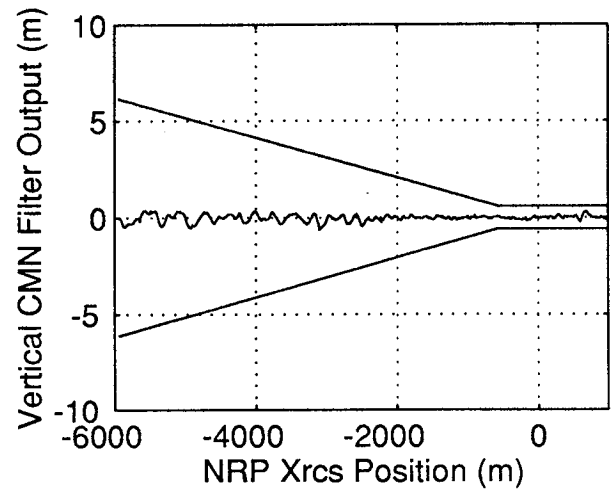
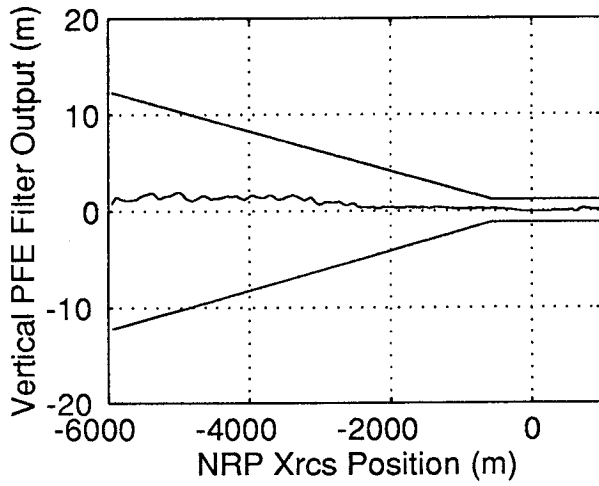
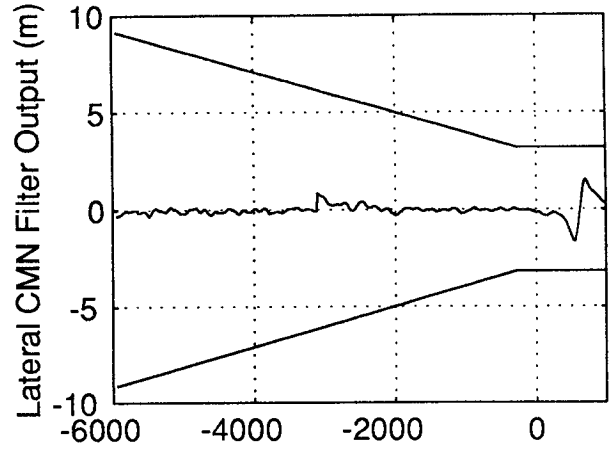
LGRP Xrcs POSITION (m): 153.172
LGRP Yrcs POSITION (m): 0.038



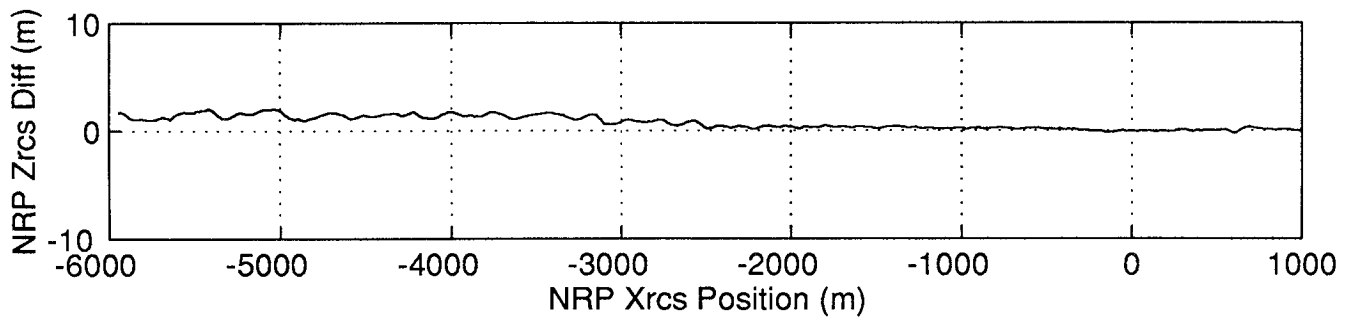
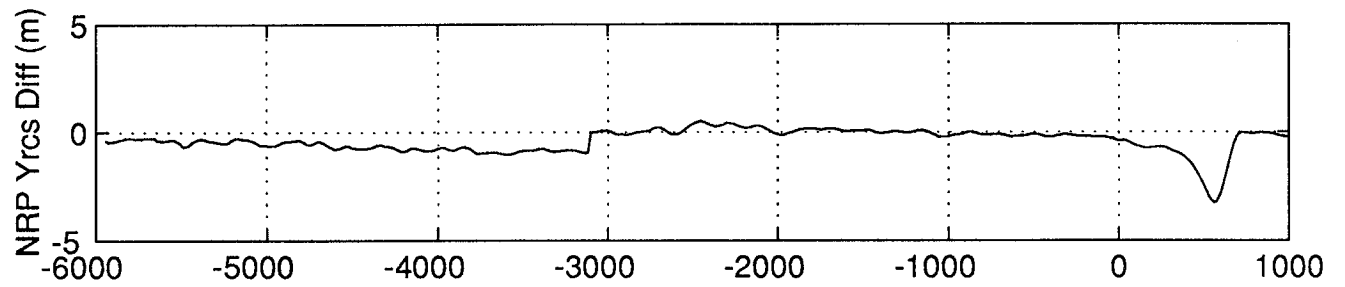
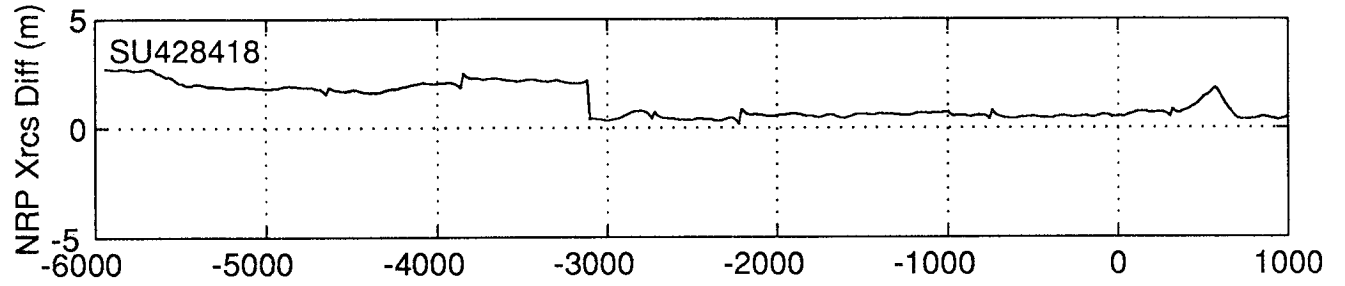
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428420
START TIME: 239253.749
STOP TIME: 239365.499

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.8
AVERAGE VDOP: 5.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.415
NRP Yrcs MEAN DIFFERENCE (m): -0.073
NRP Zrcs MEAN DIFFERENCE (m): 0.119

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.220
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.107
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.263

NRP Xrcs 2-RMS DIFFERENCE (m): 0.858
NRP Yrcs 2-RMS DIFFERENCE (m): 0.181
NRP Zrcs 2-RMS DIFFERENCE (m): 0.354

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 130.230
LGRP Yrcs POSITION (m): 0.970

APPROACH #: SU428420
START TIME: 239253.749
STOP TIME: 239365.499

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.8
AVERAGE VDOP: 5.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

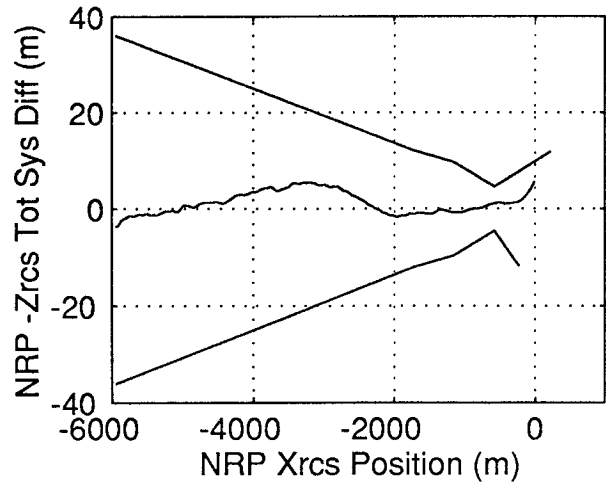
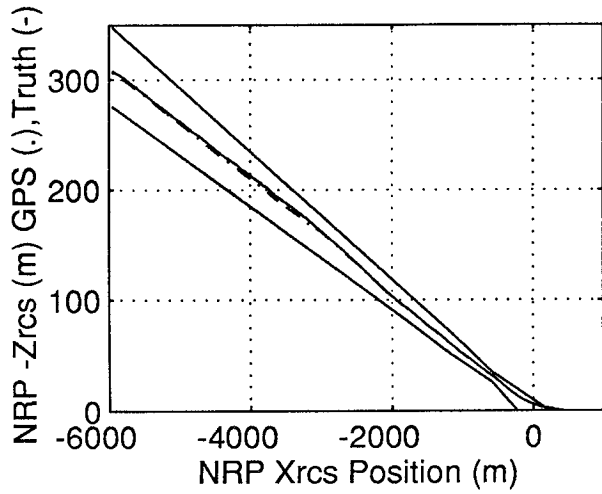
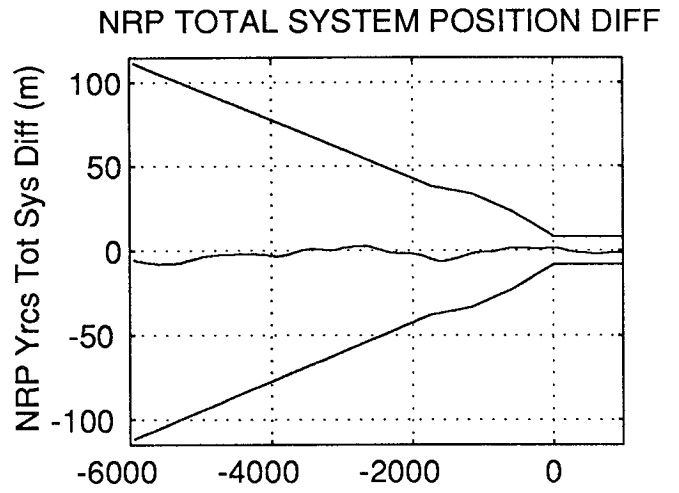
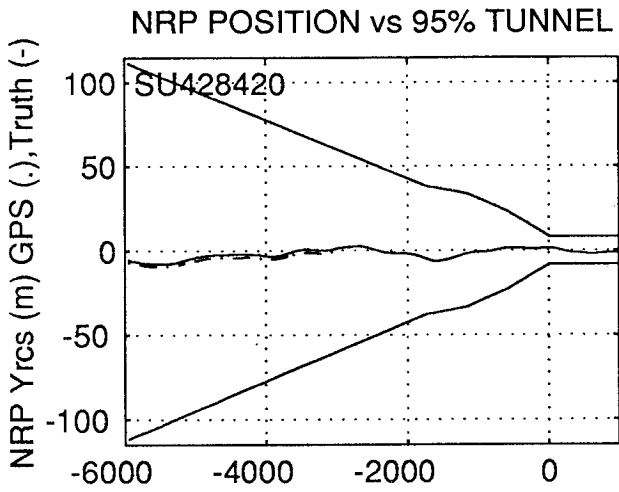
NRP Xrcs MEAN DIFFERENCE (m): 0.415
NRP Yrcs MEAN DIFFERENCE (m): -0.073
NRP Zrcs MEAN DIFFERENCE (m): 0.119

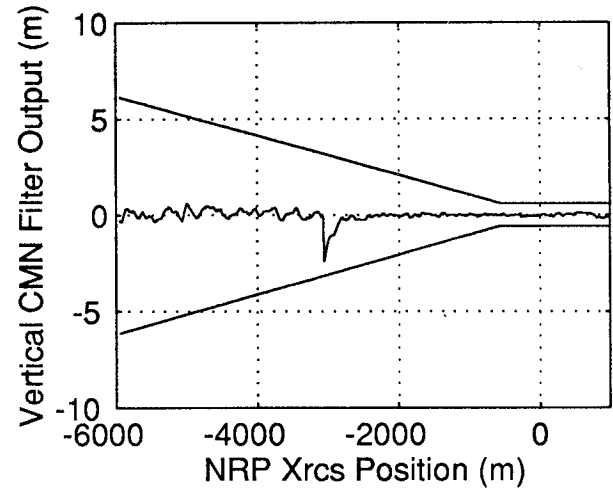
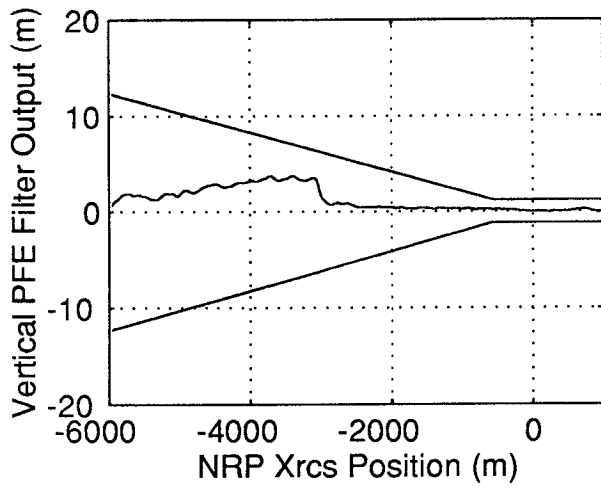
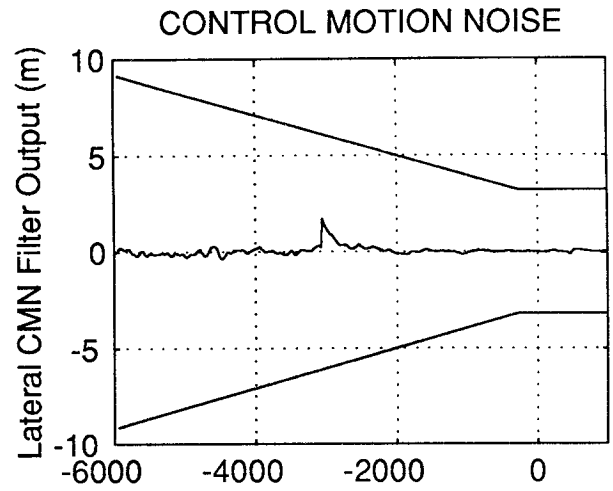
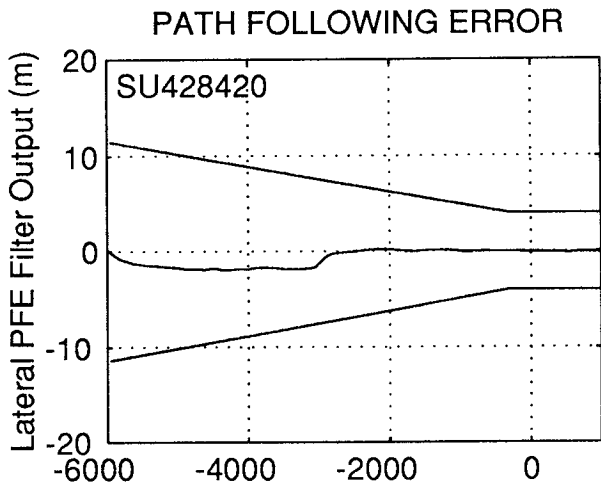
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.220
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.107
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.263

NRP Xrcs 2-RMS DIFFERENCE (m): 0.858
NRP Yrcs 2-RMS DIFFERENCE (m): 0.181
NRP Zrcs 2-RMS DIFFERENCE (m): 0.354

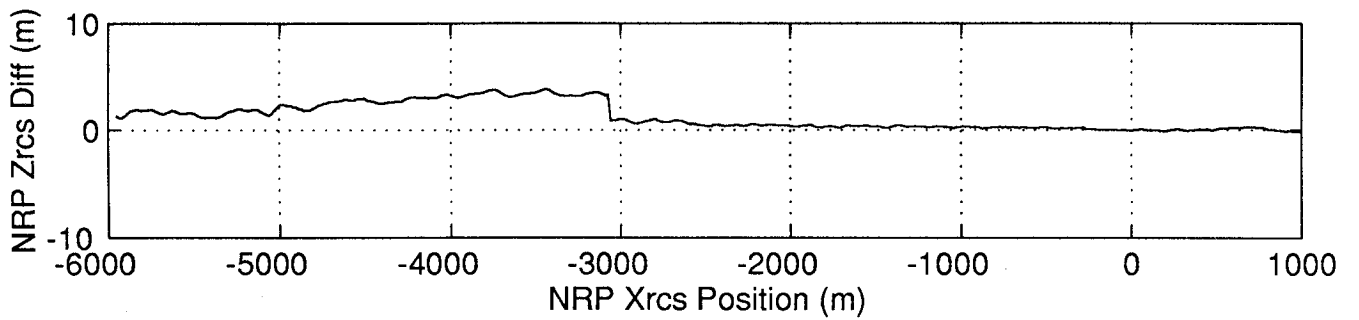
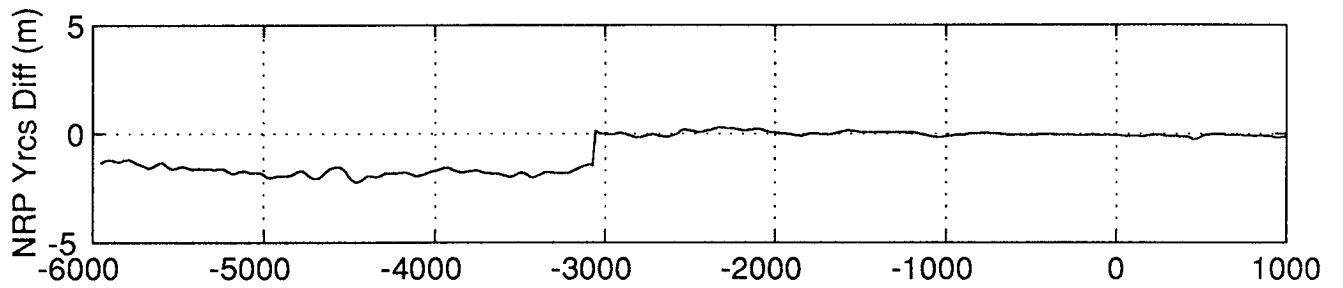
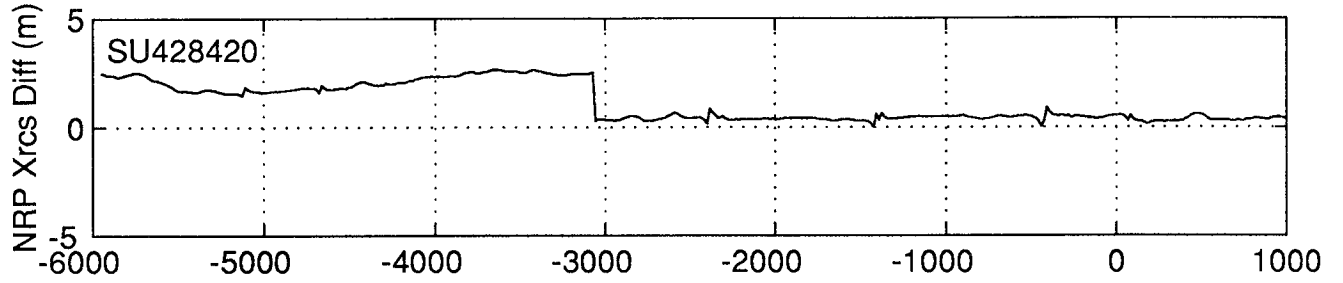
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 130.230
LGRP Yrcs POSITION (m): 0.970





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428422
START TIME: 239663.999
STOP TIME: 239775.249

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.3
AVERAGE HDOP: 3.3

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.499
NRP Yrcs MEAN DIFFERENCE (m): -0.103
NRP Zrcs MEAN DIFFERENCE (m): 0.005

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.251
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.127
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.265

NRP Xrcs 2-RMS DIFFERENCE (m): 1.029
NRP Yrcs 2-RMS DIFFERENCE (m): 0.243
NRP Zrcs 2-RMS DIFFERENCE (m): 0.265

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 278.237
LGRP Yrcs POSITION (m): -0.682

APPROACH #: SU428422
START TIME: 239663.999
STOP TIME: 239775.249

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.3
AVERAGE HDOP: 3.3

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

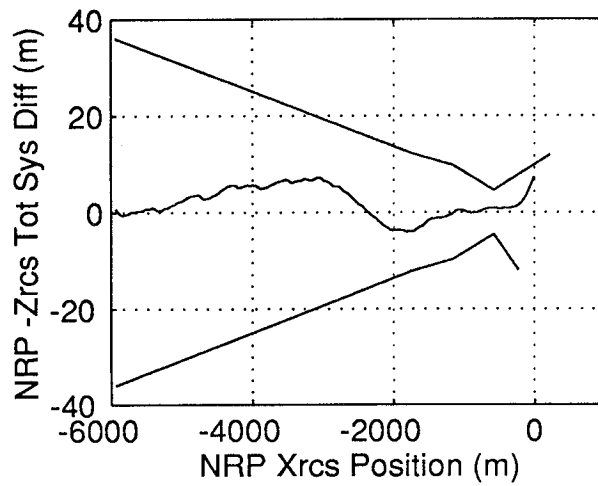
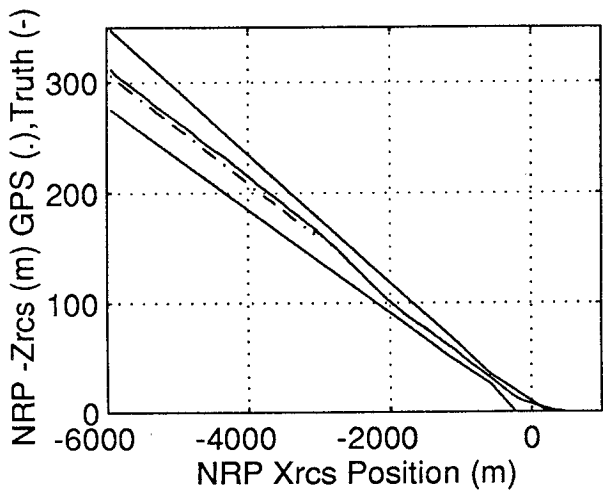
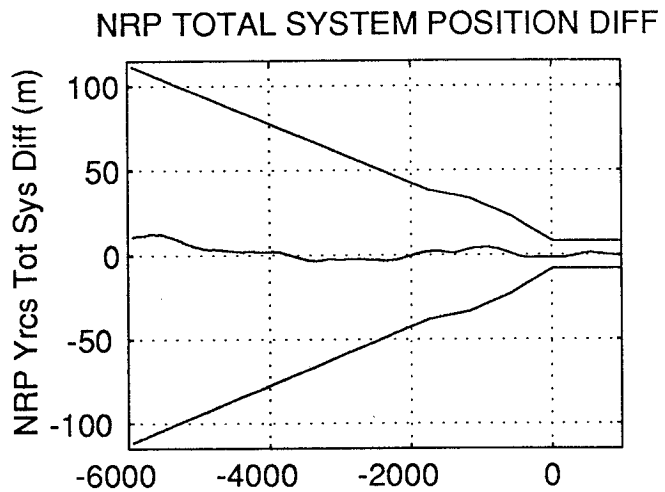
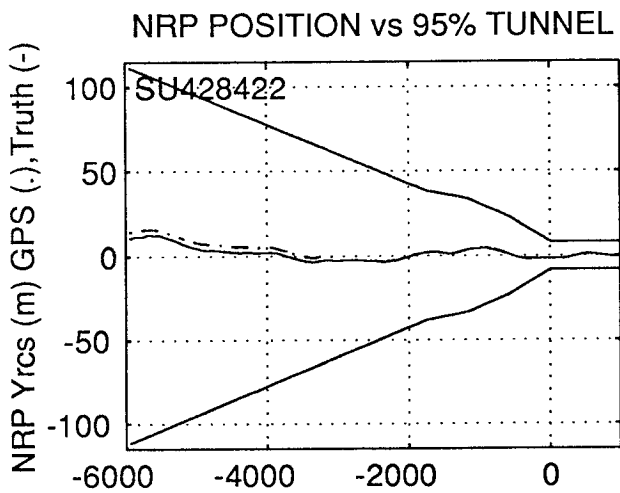
NRP Xrcs MEAN DIFFERENCE (m): 0.499
NRP Yrcs MEAN DIFFERENCE (m): -0.103
NRP Zrcs MEAN DIFFERENCE (m): 0.005

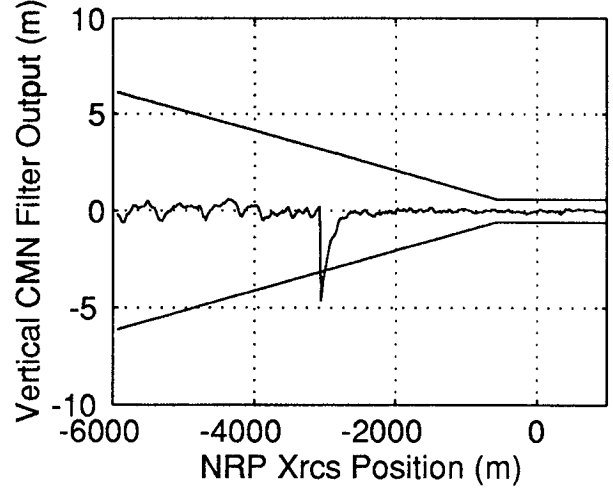
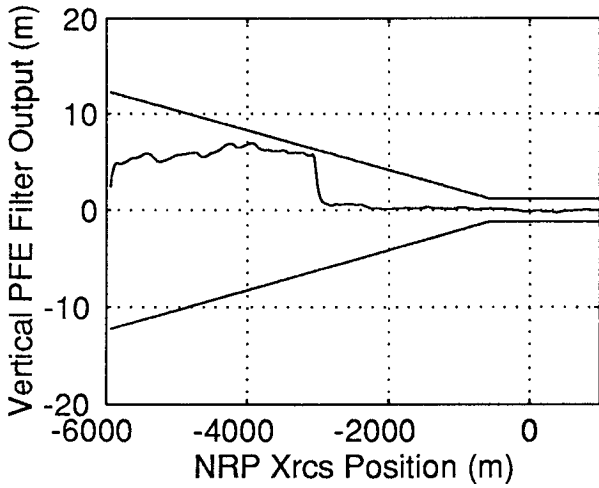
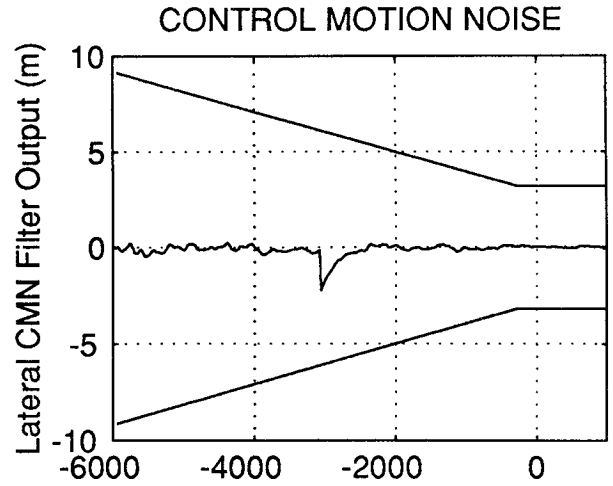
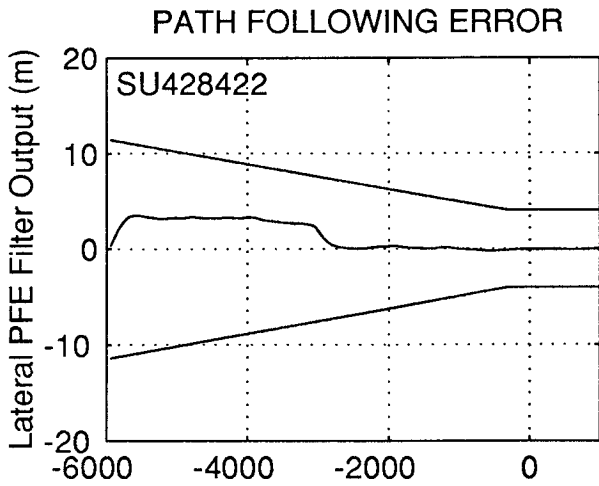
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.251
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.127
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.265

NRP Xrcs 2-RMS DIFFERENCE (m): 1.029
NRP Yrcs 2-RMS DIFFERENCE (m): 0.243
NRP Zrcs 2-RMS DIFFERENCE (m): 0.265

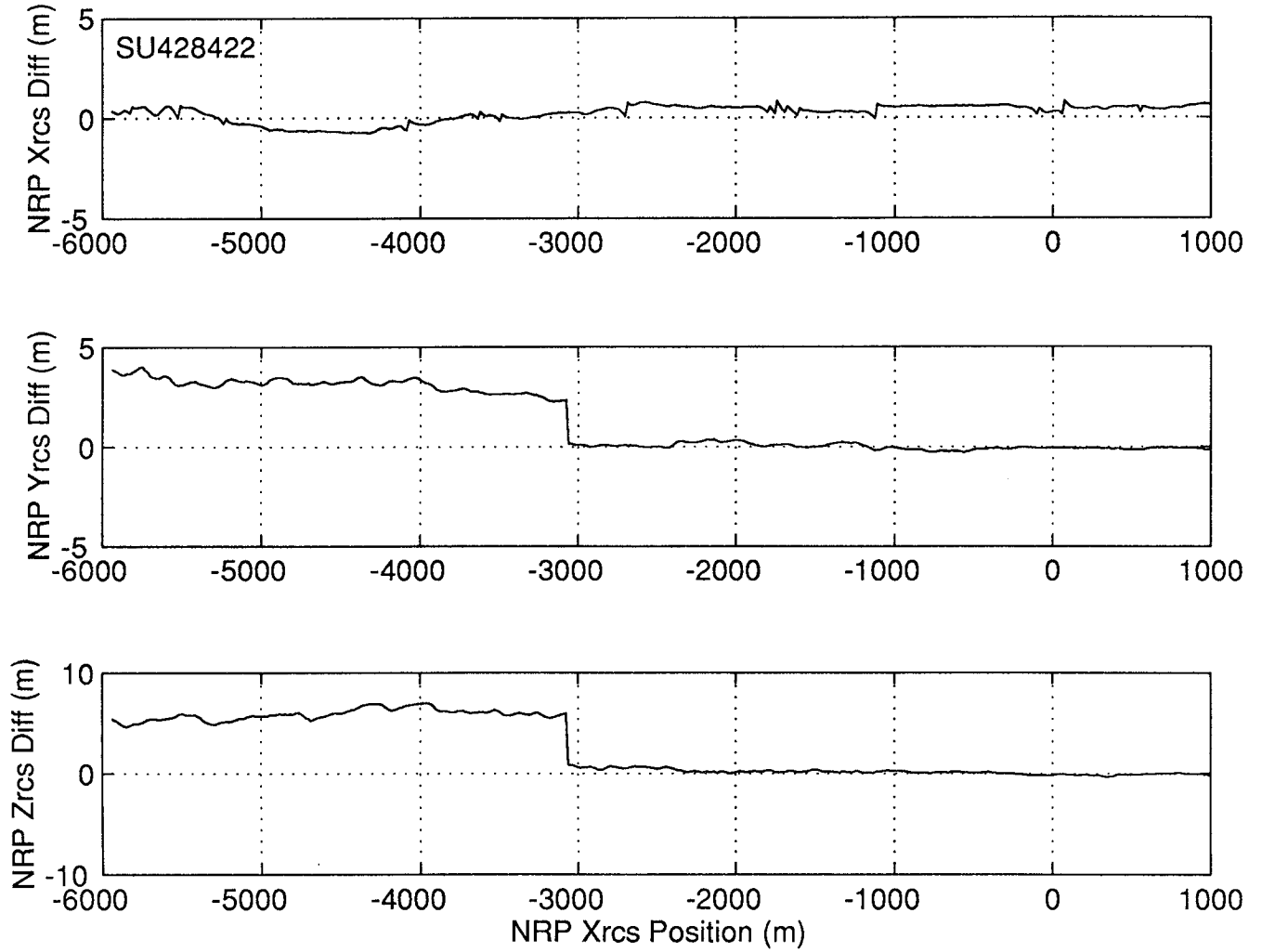
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 278.237
LGRP Yrcs POSITION (m): -0.682





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428424
START TIME: 240104.249
STOP TIME: 240216.499

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.422
NRP Yrcs MEAN DIFFERENCE (m): -0.053
NRP Zrcs MEAN DIFFERENCE (m): -0.032

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.273
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.158
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.219

NRP Xrcs 2-RMS DIFFERENCE (m): 0.888
NRP Yrcs 2-RMS DIFFERENCE (m): 0.191
NRP Zrcs 2-RMS DIFFERENCE (m): 0.228

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 111.021
LGRP Yrcs POSITION (m): -1.754

APPROACH #: SU428424
START TIME: 240104.249
STOP TIME: 240216.499

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

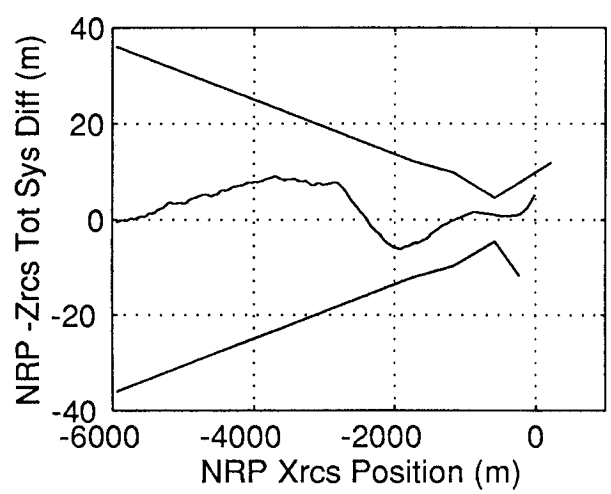
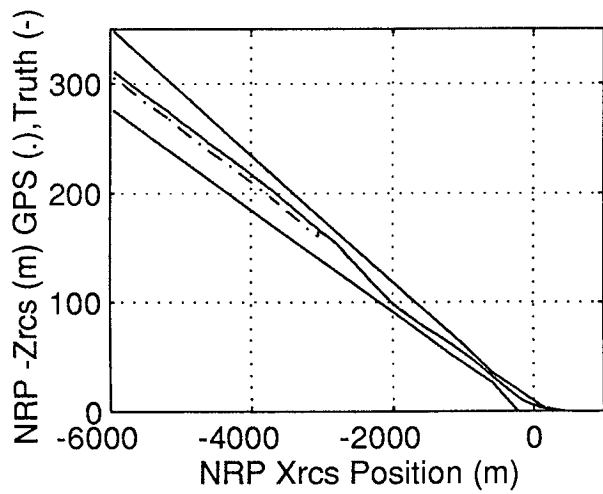
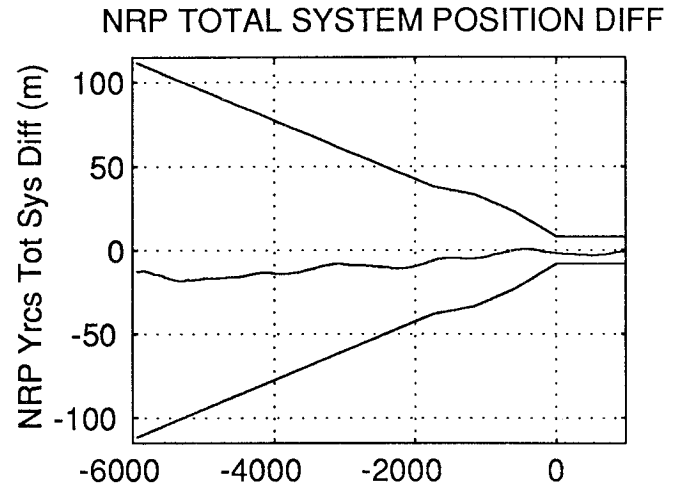
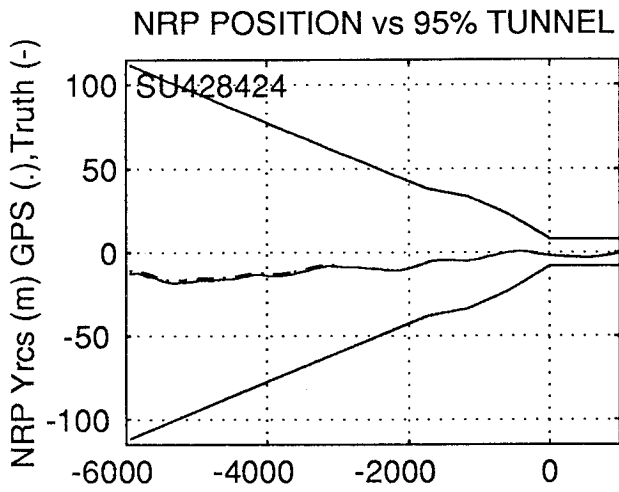
NRP Xrcs MEAN DIFFERENCE (m): 0.422
NRP Yrcs MEAN DIFFERENCE (m): -0.053
NRP Zrcs MEAN DIFFERENCE (m): -0.032

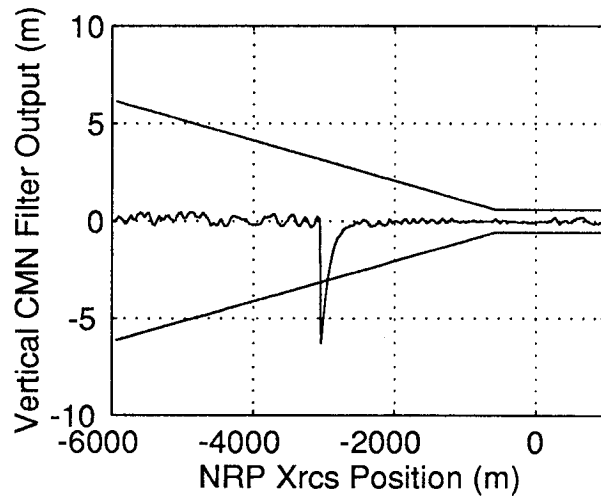
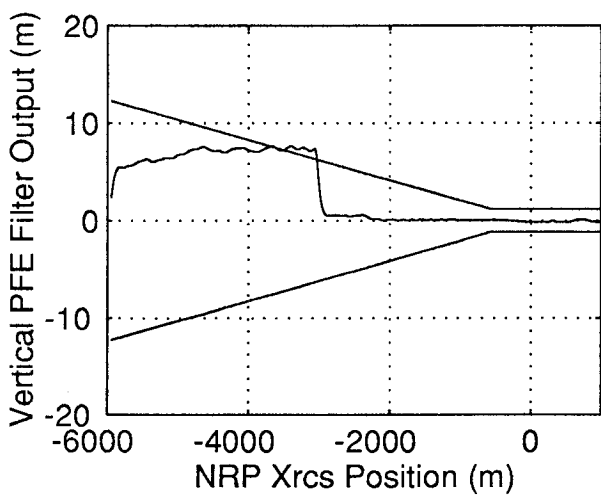
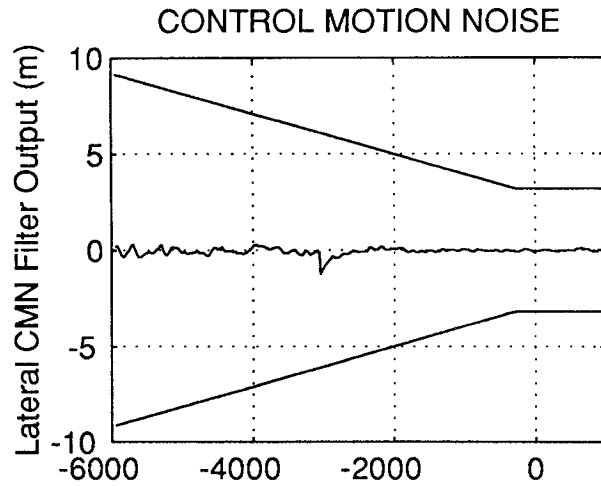
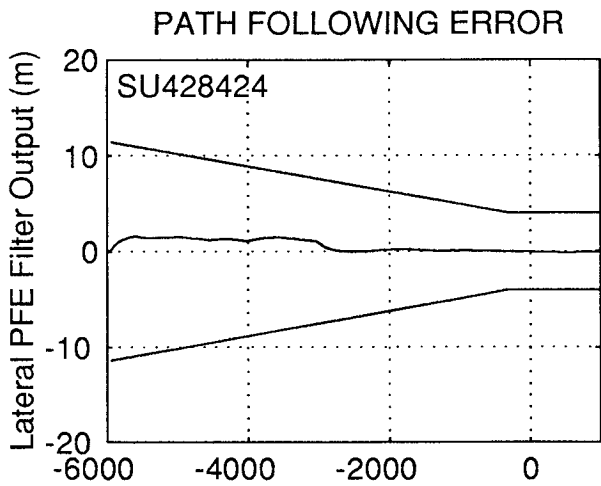
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.273
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.158
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.219

NRP Xrcs 2-RMS DIFFERENCE (m): 0.888
NRP Yrcs 2-RMS DIFFERENCE (m): 0.191
NRP Zrcs 2-RMS DIFFERENCE (m): 0.228

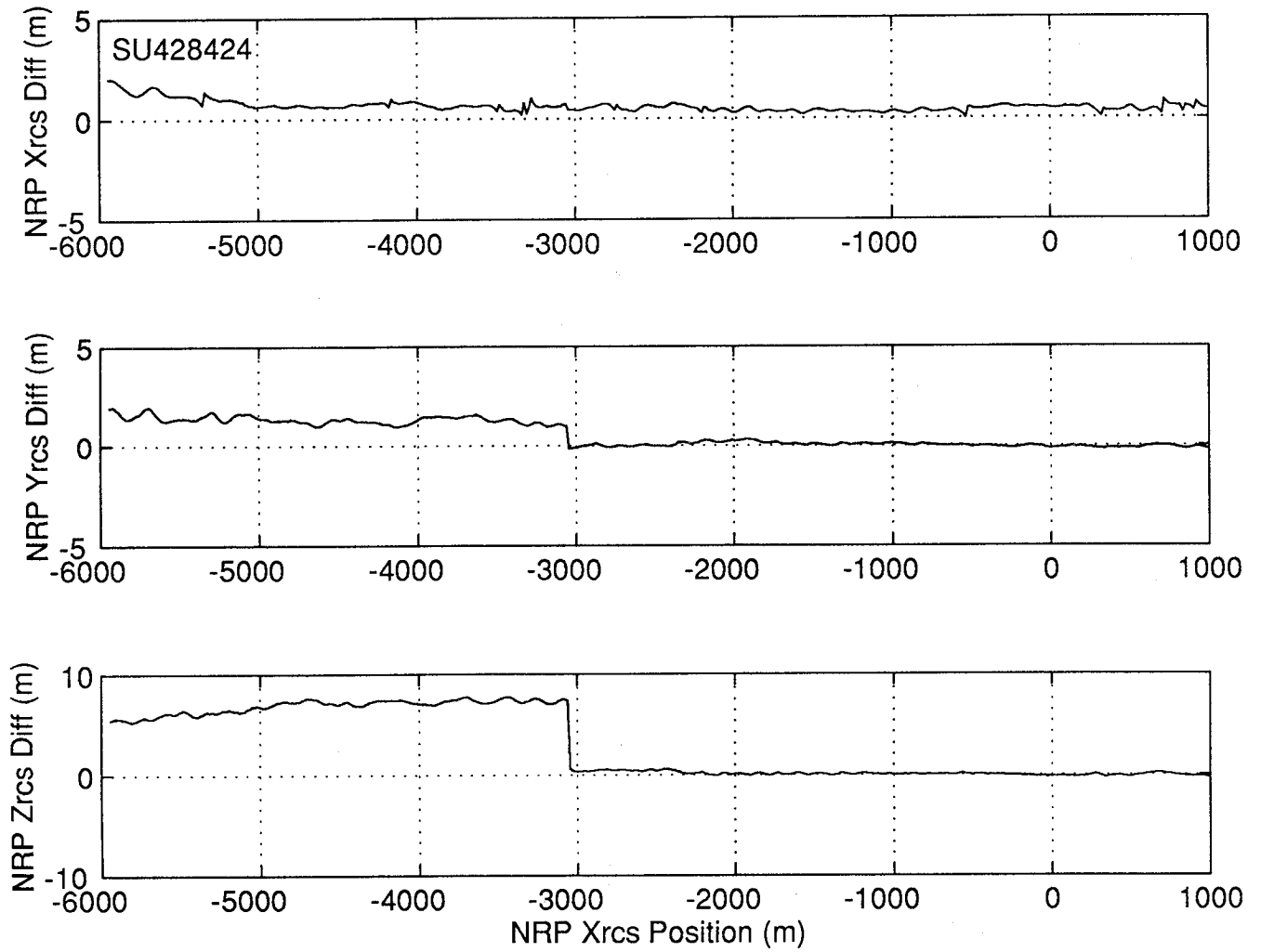
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 111.021
LGRP Yrcs POSITION (m): -1.754





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428426
START TIME: 240510.249
STOP TIME: 240625.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.2
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.532
NRP Yrcs MEAN DIFFERENCE (m): -0.134
NRP Zrcs MEAN DIFFERENCE (m): 0.094

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.309
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.317
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.211

NRP Xrcs 2-RMS DIFFERENCE (m): 1.107
NRP Yrcs 2-RMS DIFFERENCE (m): 0.415
NRP Zrcs 2-RMS DIFFERENCE (m): 0.282

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 206.503
LGRP Yrcs POSITION (m): 0.040

APPROACH #: SU428426
START TIME: 240510.249
STOP TIME: 240625.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.2
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

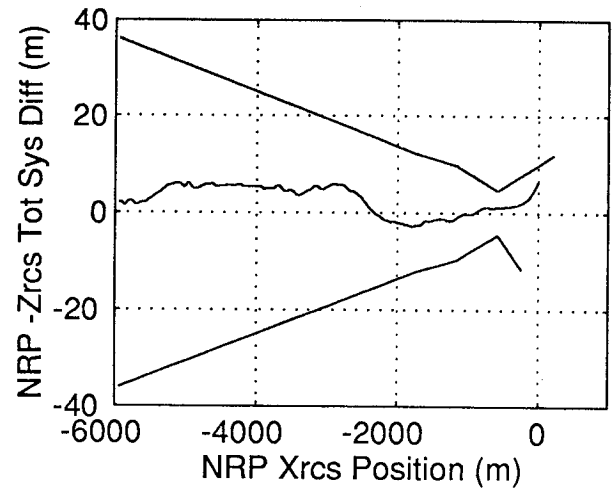
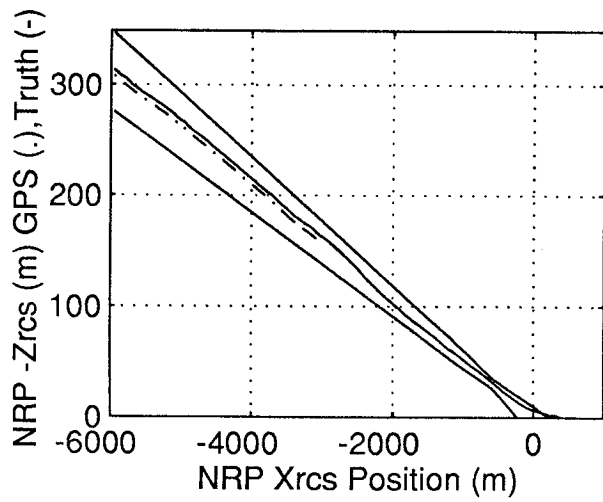
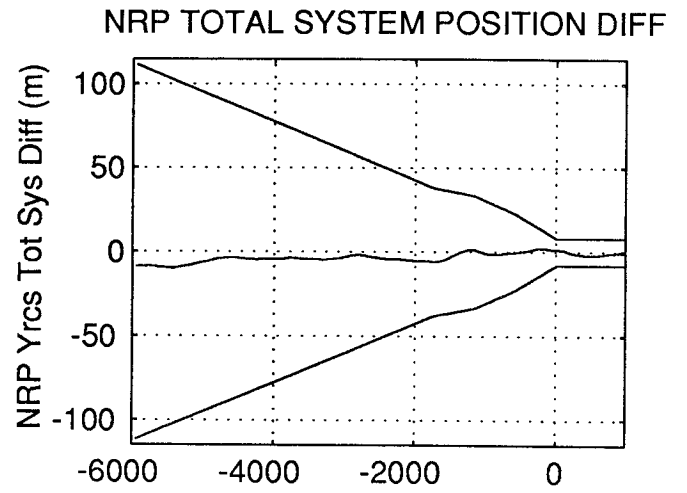
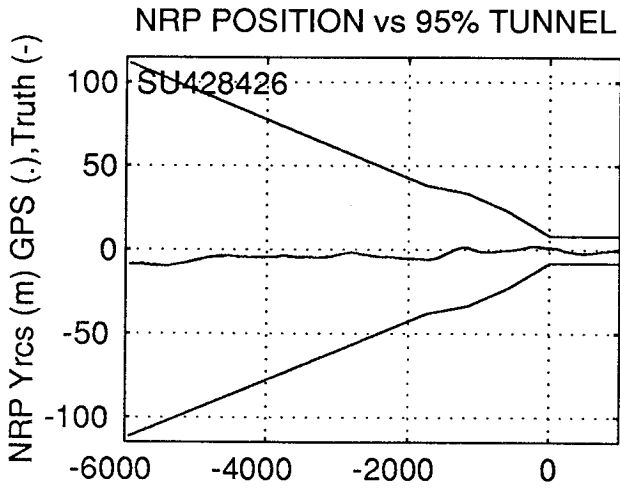
NRP Xrcs MEAN DIFFERENCE (m): 0.532
NRP Yrcs MEAN DIFFERENCE (m): -0.134
NRP Zrcs MEAN DIFFERENCE (m): 0.094

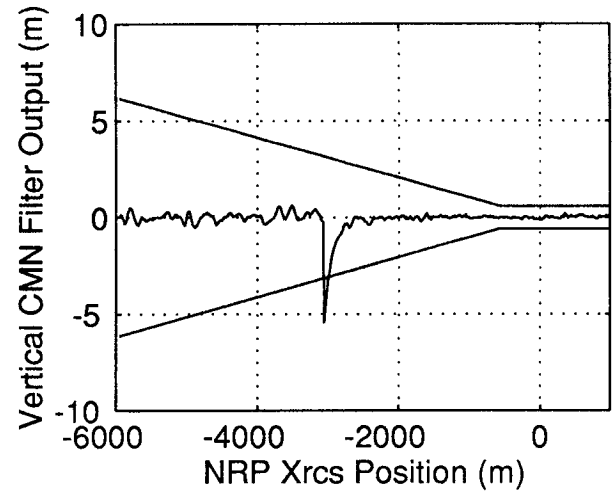
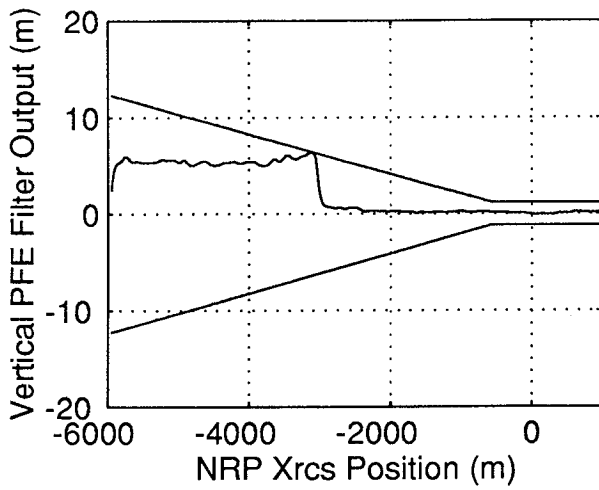
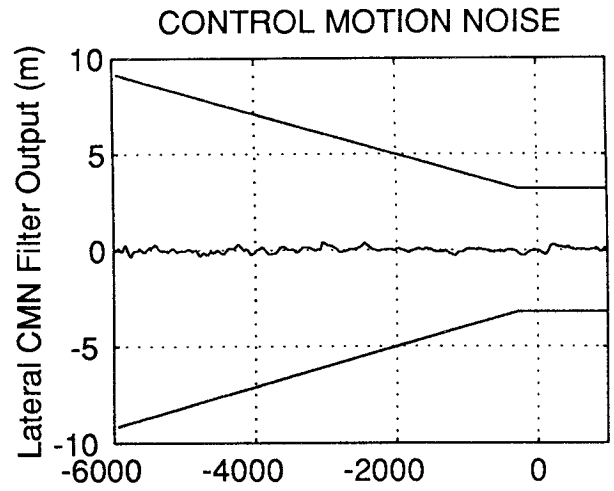
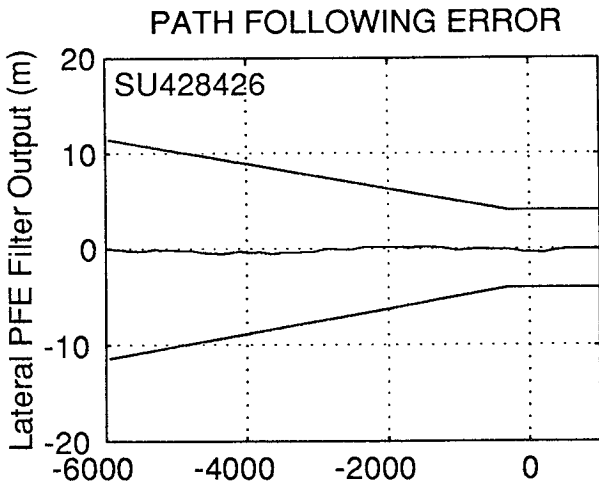
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.309
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.317
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.211

NRP Xrcs 2-RMS DIFFERENCE (m): 1.107
NRP Yrcs 2-RMS DIFFERENCE (m): 0.415
NRP Zrcs 2-RMS DIFFERENCE (m): 0.282

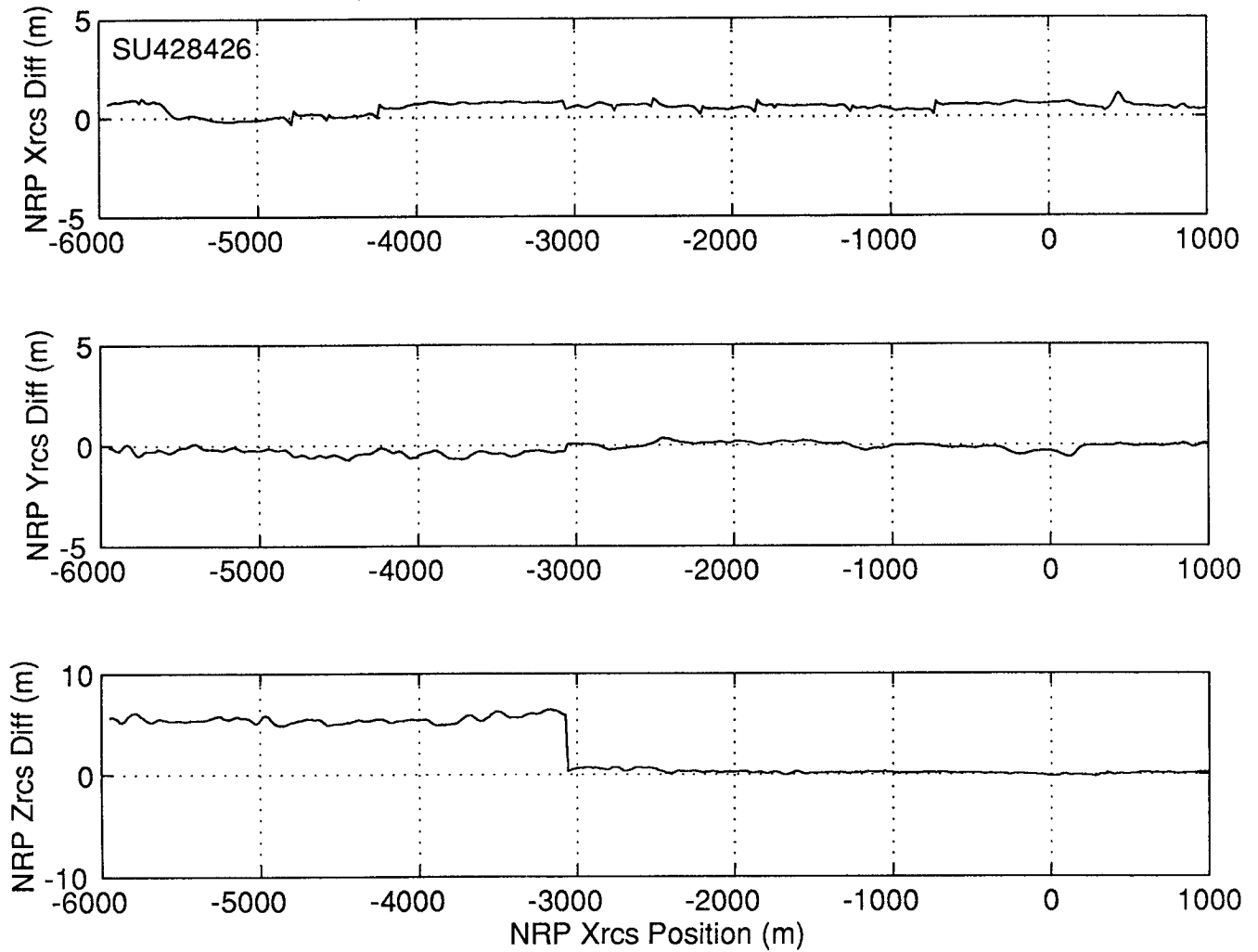
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 206.503
LGRP Yrcs POSITION (m): 0.040





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428430
START TIME: 241501.749
STOP TIME: 241613.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.497
NRP Yrcs MEAN DIFFERENCE (m): -0.207
NRP Zrcs MEAN DIFFERENCE (m): 0.069

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.316
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.363
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.236

NRP Xrcs 2-RMS DIFFERENCE (m): 1.042
NRP Yrcs 2-RMS DIFFERENCE (m): 0.551
NRP Zrcs 2-RMS DIFFERENCE (m): 0.273

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 214.023
LGRP Yrcs POSITION (m): 0.650

APPROACH #: SU428430
START TIME: 241501.749
STOP TIME: 241613.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

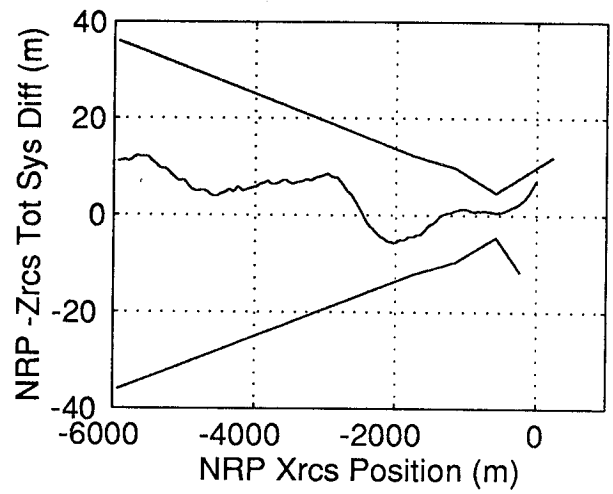
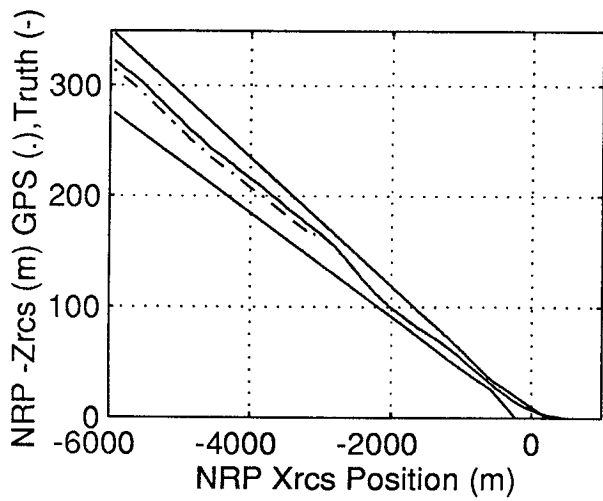
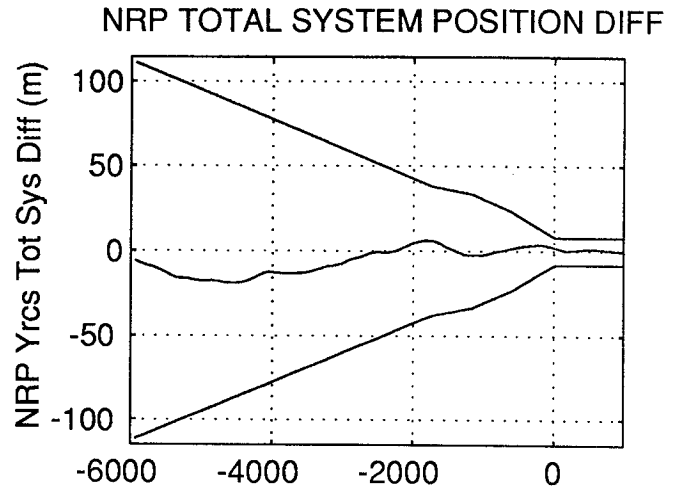
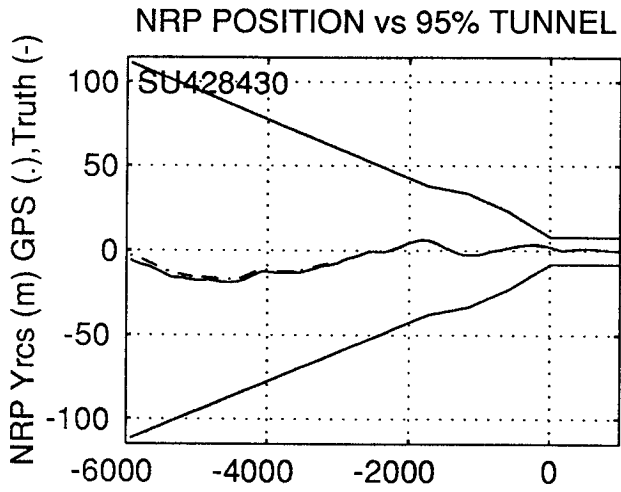
NRP Xrcs MEAN DIFFERENCE (m): 0.497
NRP Yrcs MEAN DIFFERENCE (m): -0.207
NRP Zrcs MEAN DIFFERENCE (m): 0.069

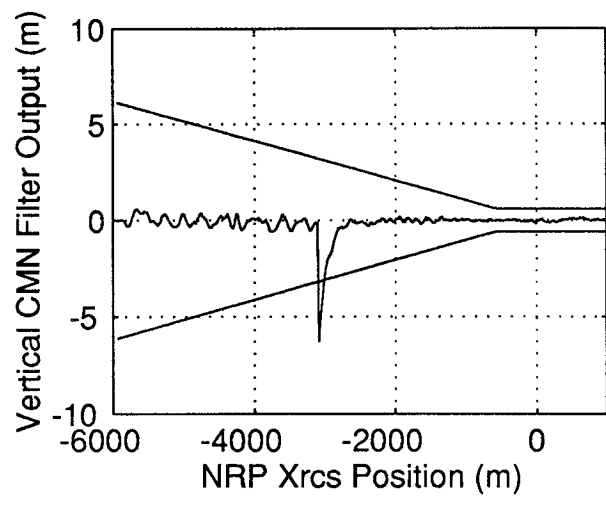
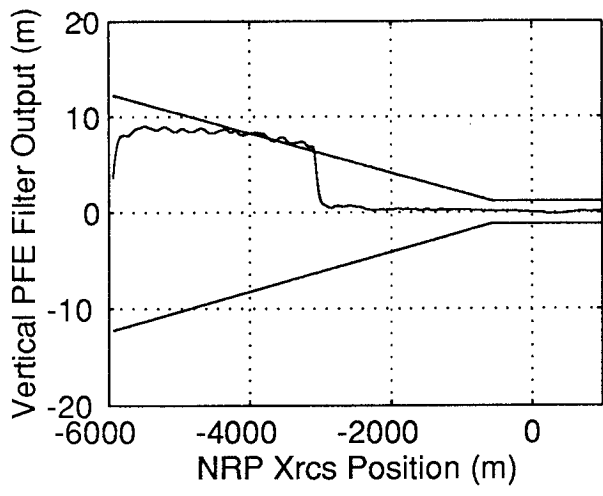
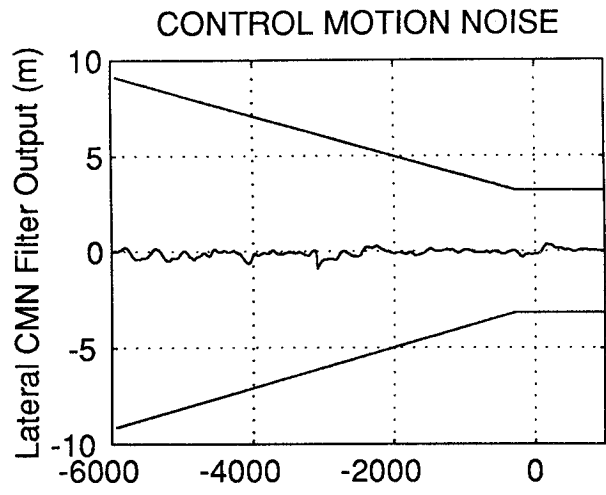
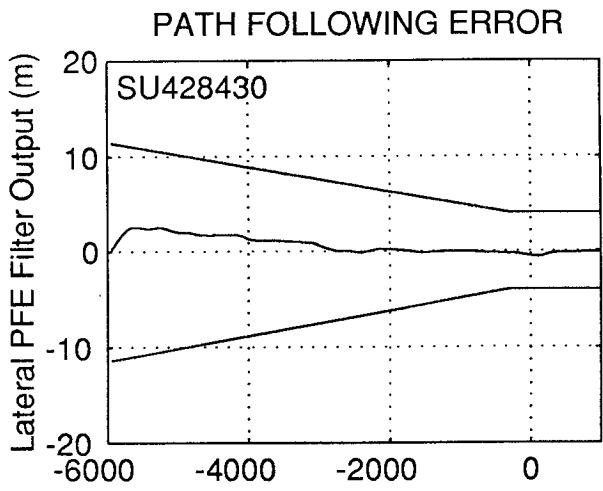
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.316
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.363
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.236

NRP Xrcs 2-RMS DIFFERENCE (m): 1.042
NRP Yrcs 2-RMS DIFFERENCE (m): 0.551
NRP Zrcs 2-RMS DIFFERENCE (m): 0.273

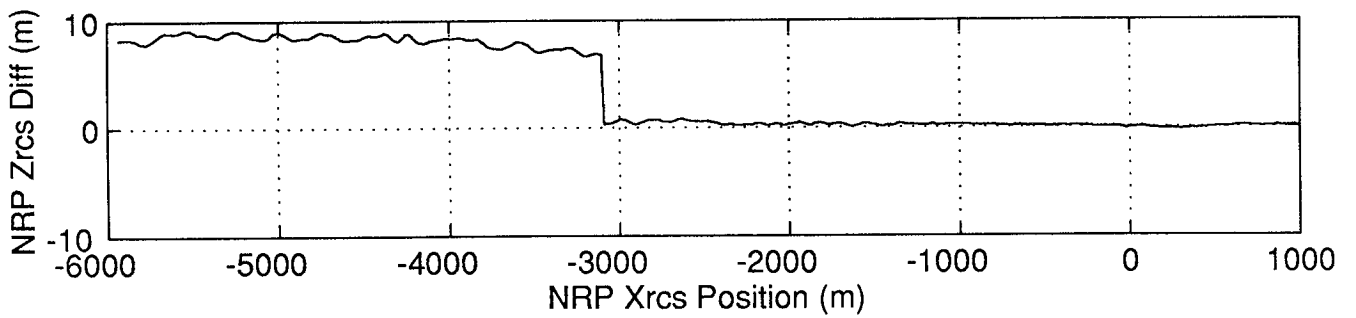
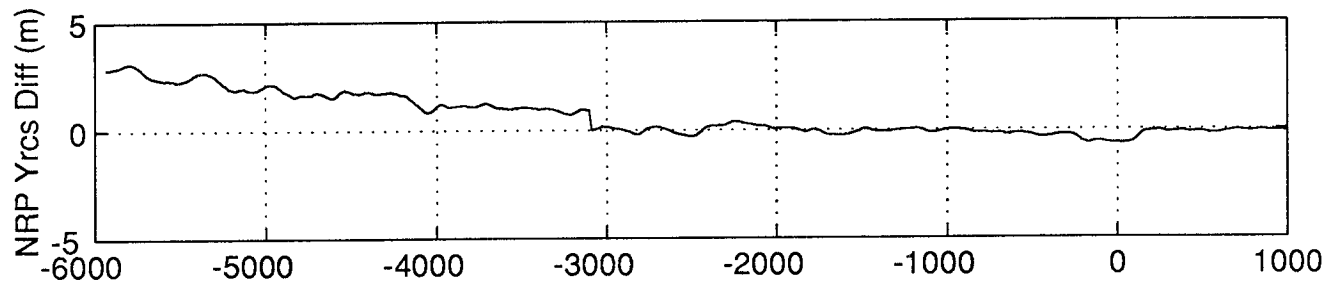
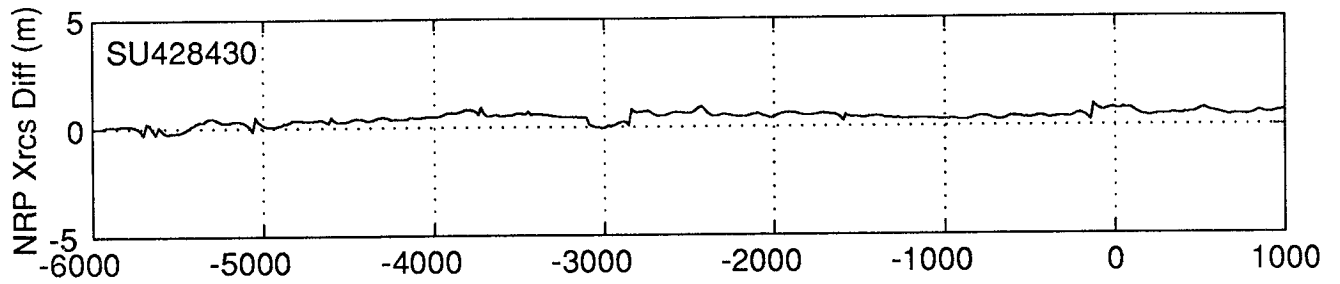
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 214.023
LGRP Yrcs POSITION (m): 0.650





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428432
START TIME: 241953.999
STOP TIME: 242072.499

APPROACH #: SU428432
START TIME: 241953.999
STOP TIME: 242072.499

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.9

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.5

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.448
NRP Yrcs MEAN DIFFERENCE (m): -0.024
NRP Zrcs MEAN DIFFERENCE (m): 0.054

NRP Xrcs MEAN DIFFERENCE (m): 0.448
NRP Yrcs MEAN DIFFERENCE (m): -0.024
NRP Zrcs MEAN DIFFERENCE (m): 0.054

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.282
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.112
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.293

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.282
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.112
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.293

NRP Xrcs 2-RMS DIFFERENCE (m): 0.939
NRP Yrcs 2-RMS DIFFERENCE (m): 0.122
NRP Zrcs 2-RMS DIFFERENCE (m): 0.312

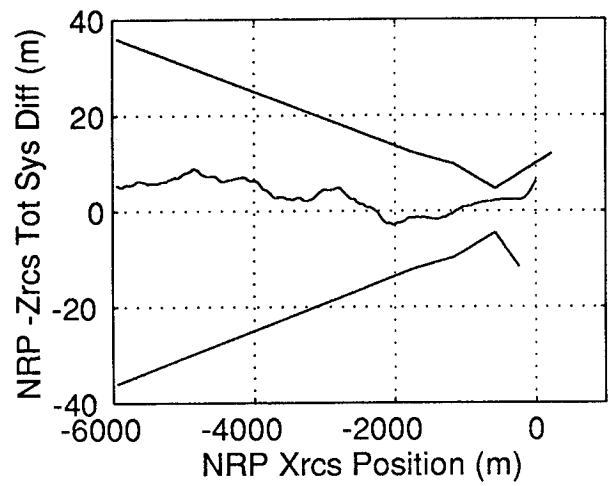
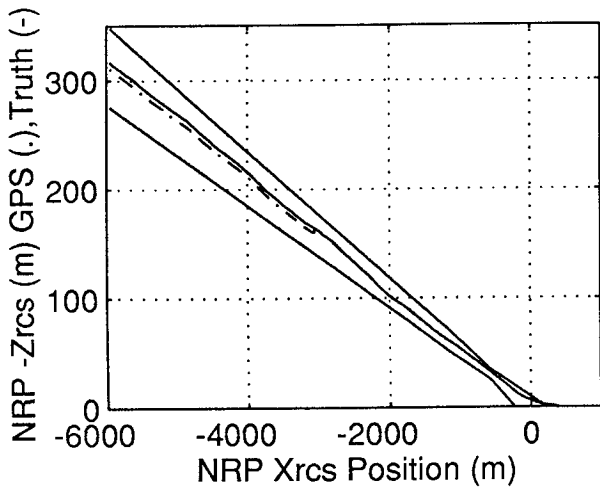
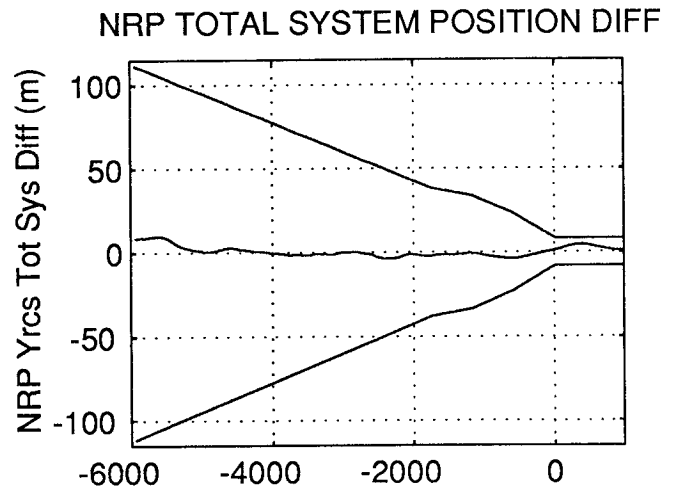
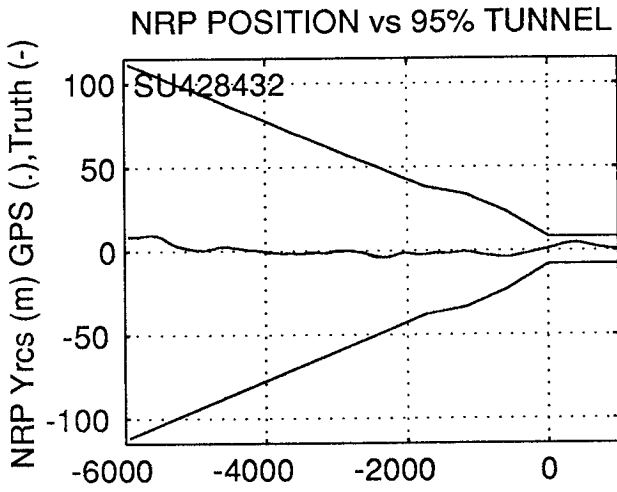
NRP Xrcs 2-RMS DIFFERENCE (m): 0.939
NRP Yrcs 2-RMS DIFFERENCE (m): 0.122
NRP Zrcs 2-RMS DIFFERENCE (m): 0.312

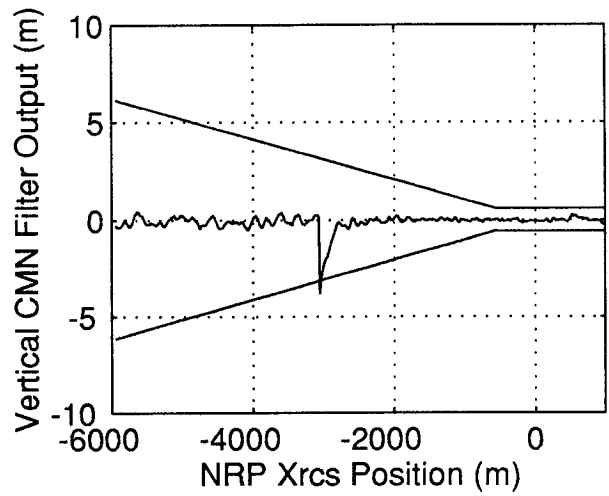
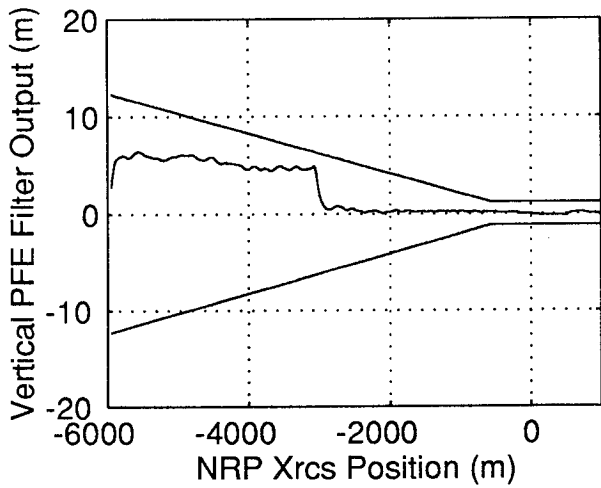
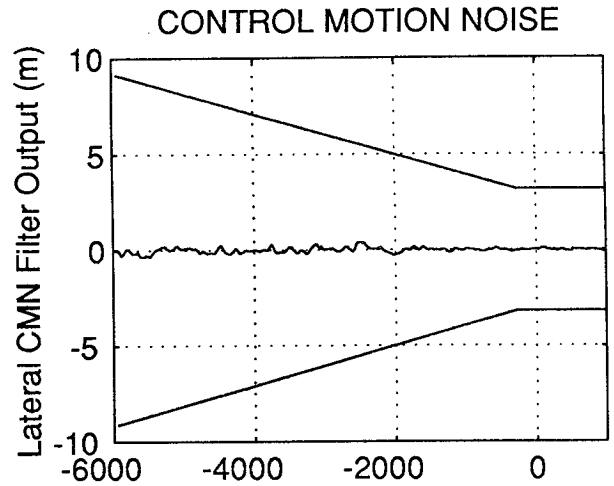
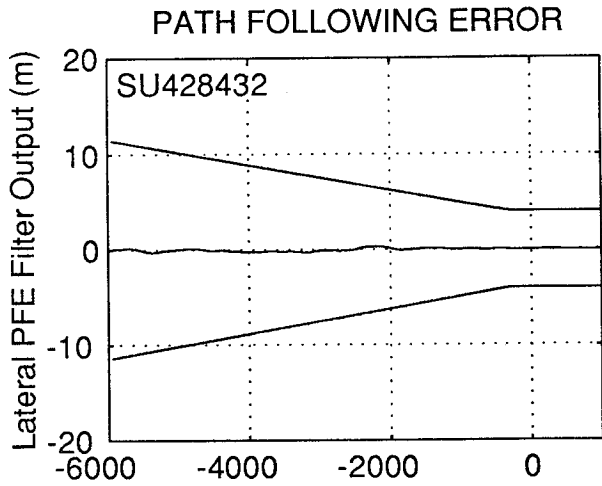
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

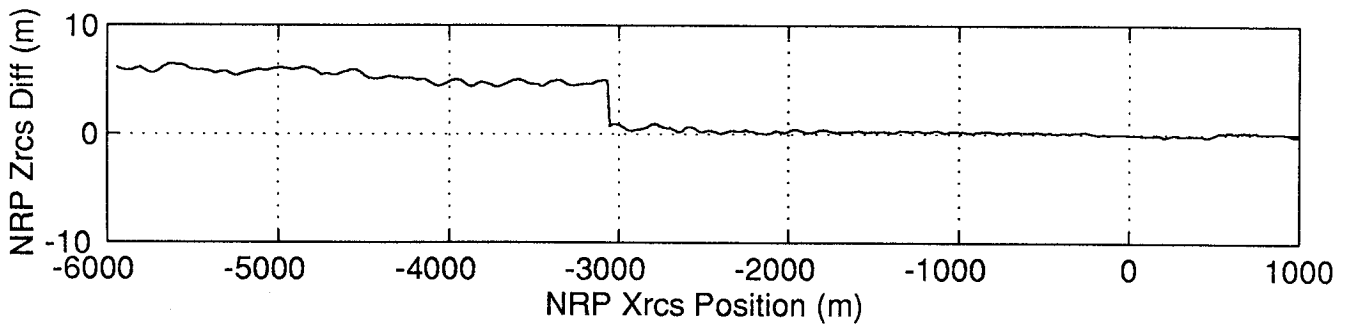
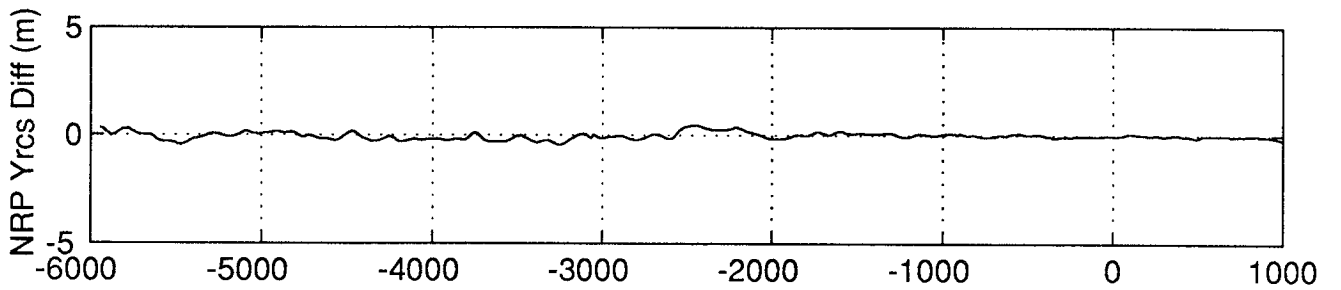
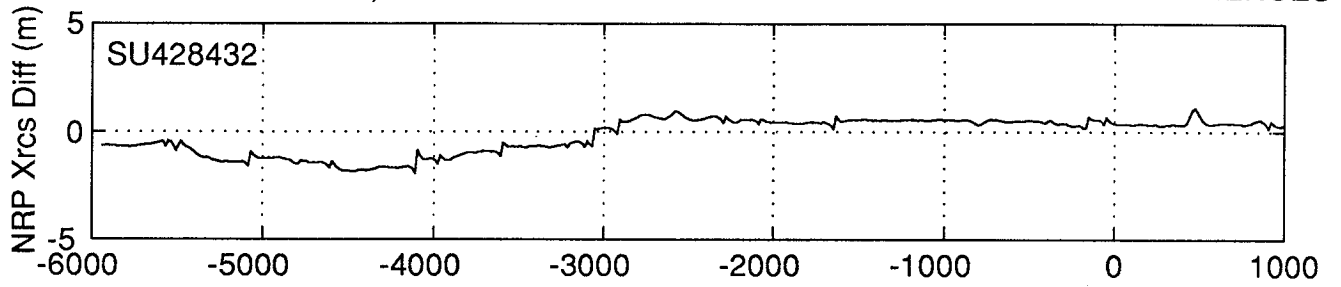
LGRP Xrcs POSITION (m): 142.172
LGRP Yrcs POSITION (m): 3.233

LGRP Xrcs POSITION (m): 142.172
LGRP Yrcs POSITION (m): 3.233





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428434
START TIME: 242365.249
STOP TIME: 242481.749

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.7
AVERAGE VDOP: 5.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.472
NRP Yrcs MEAN DIFFERENCE (m): -0.184
NRP Zrcs MEAN DIFFERENCE (m): 0.053

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.261
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.287
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.267

NRP Xrcs 2-RMS DIFFERENCE (m): 0.979
NRP Yrcs 2-RMS DIFFERENCE (m): 0.467
NRP Zrcs 2-RMS DIFFERENCE (m): 0.287

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 229.074
LGRP Yrcs POSITION (m): -0.939

APPROACH #: SU428434
START TIME: 242365.249
STOP TIME: 242481.749

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.7
AVERAGE VDOP: 5.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

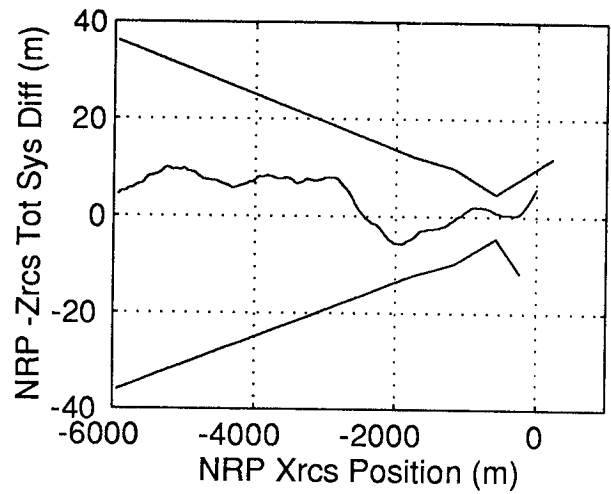
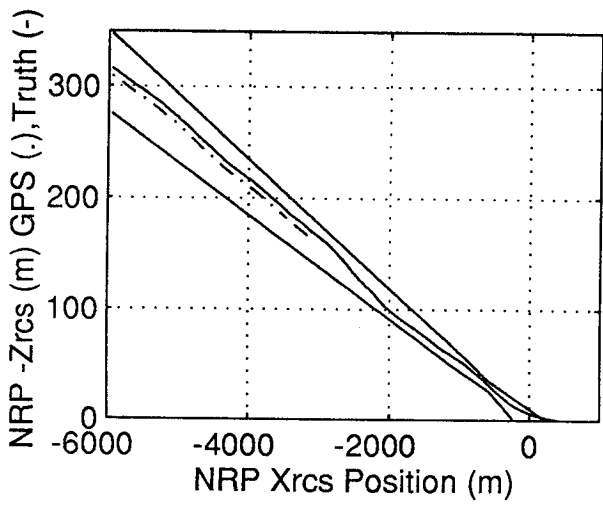
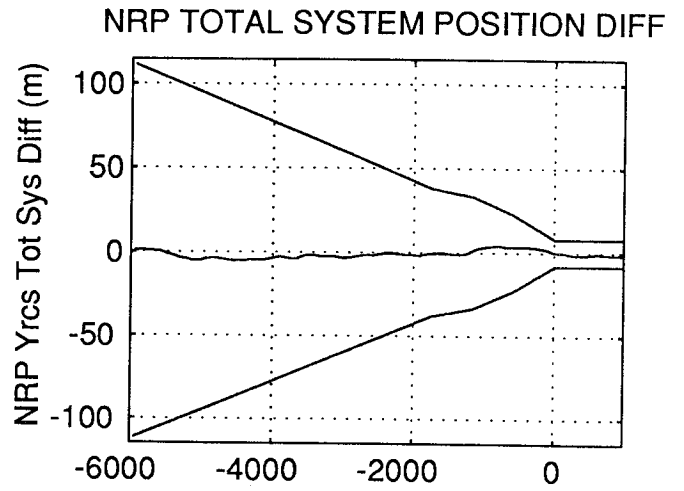
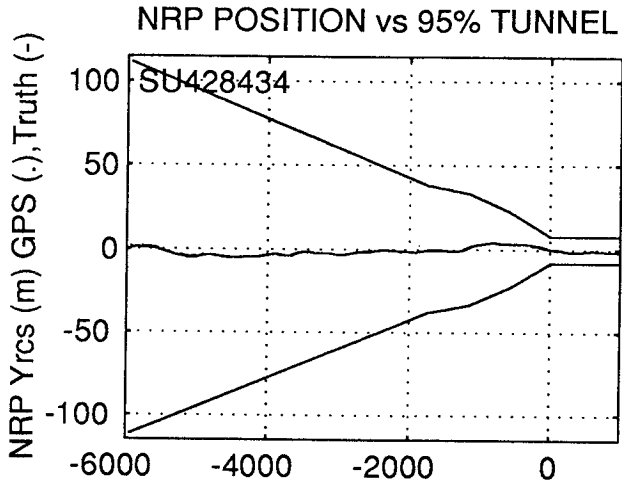
NRP Xrcs MEAN DIFFERENCE (m): 0.472
NRP Yrcs MEAN DIFFERENCE (m): -0.184
NRP Zrcs MEAN DIFFERENCE (m): 0.053

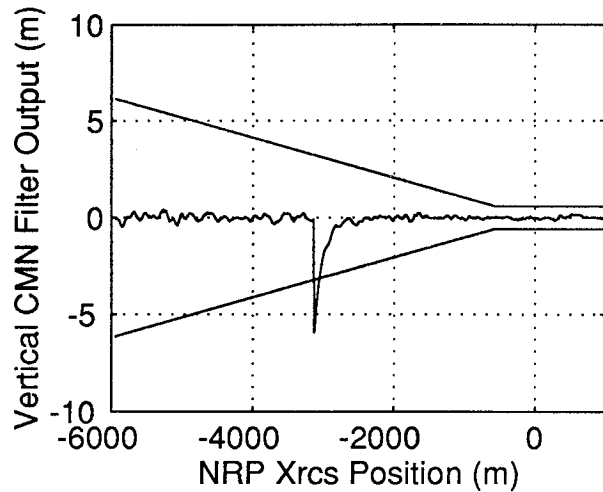
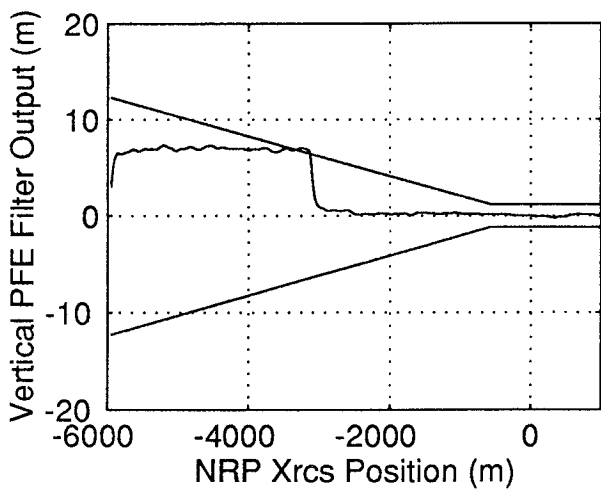
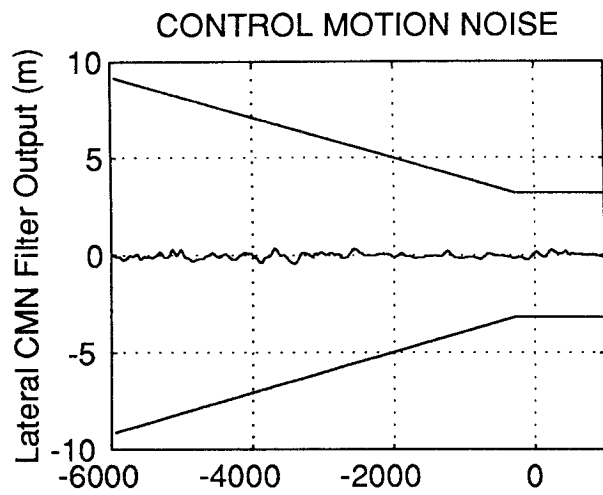
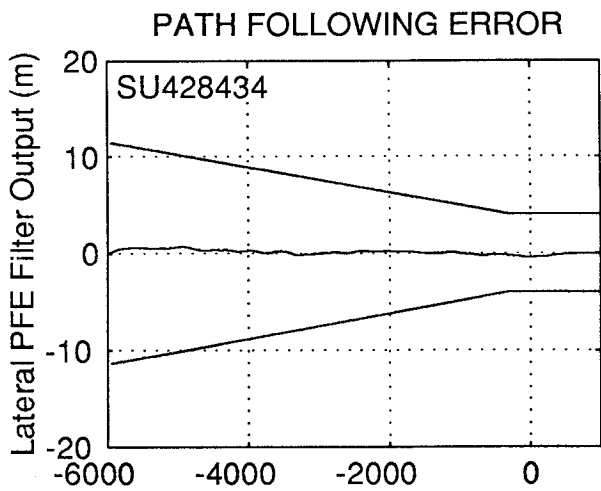
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.261
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.287
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.267

NRP Xrcs 2-RMS DIFFERENCE (m): 0.979
NRP Yrcs 2-RMS DIFFERENCE (m): 0.467
NRP Zrcs 2-RMS DIFFERENCE (m): 0.287

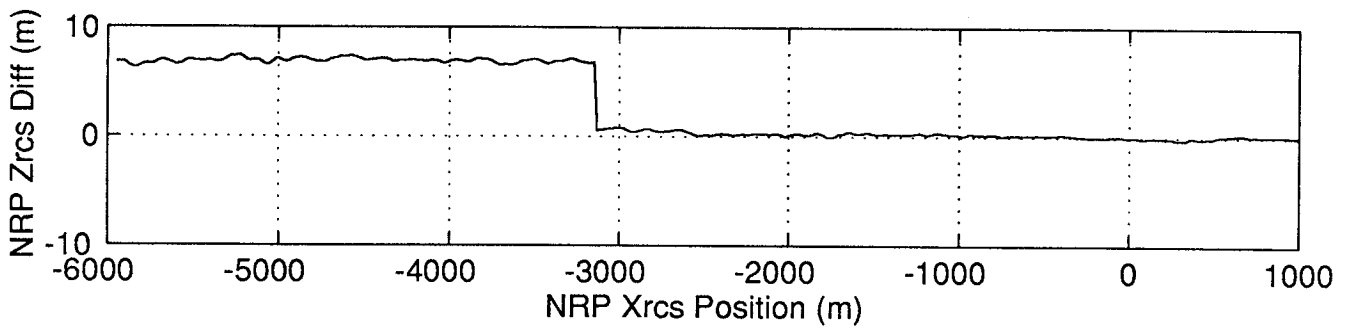
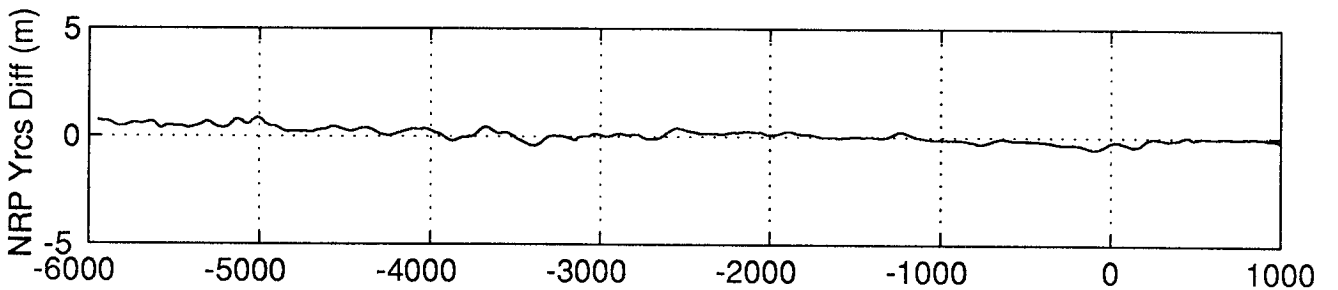
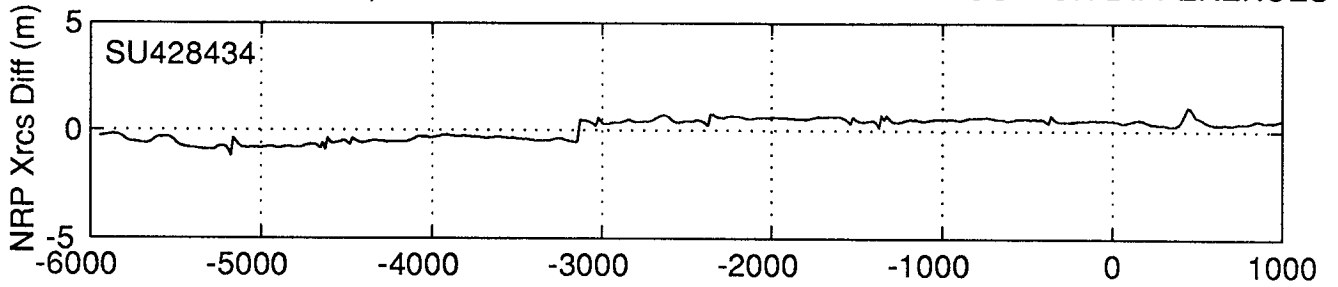
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 229.074
LGRP Yrcs POSITION (m): -0.939





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428436
START TIME: 242738.249
STOP TIME: 242852.249

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 5.9
MAXIMUM VDOP: 6.0
AVERAGE VDOP: 5.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.547
NRP Yrcs MEAN DIFFERENCE (m): -0.091
NRP Zrcs MEAN DIFFERENCE (m): 0.046

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.303
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.412
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.344

NRP Xrcs 2-RMS DIFFERENCE (m): 1.135
NRP Yrcs 2-RMS DIFFERENCE (m): 0.450
NRP Zrcs 2-RMS DIFFERENCE (m): 0.357

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 206.275
LGRP Yrcs POSITION (m): -0.372

APPROACH #: SU428436
START TIME: 242738.249
STOP TIME: 242852.249

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 5.9
MAXIMUM VDOP: 6.0
AVERAGE VDOP: 5.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

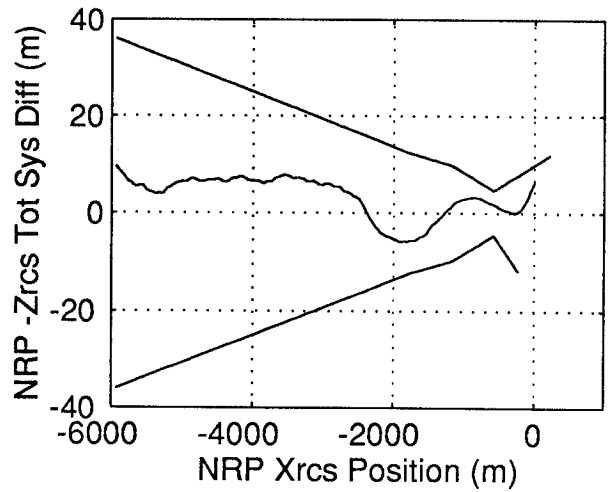
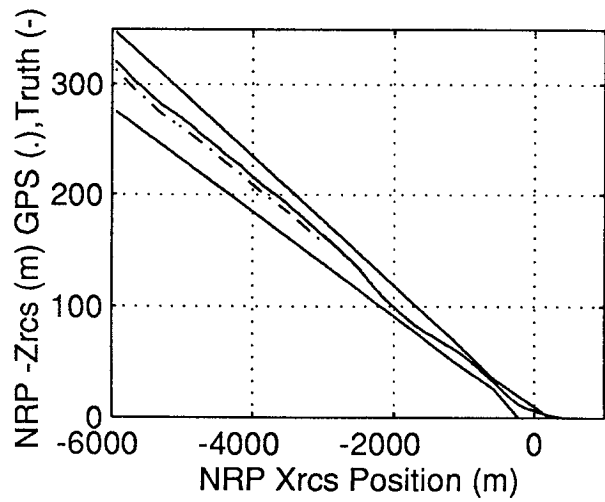
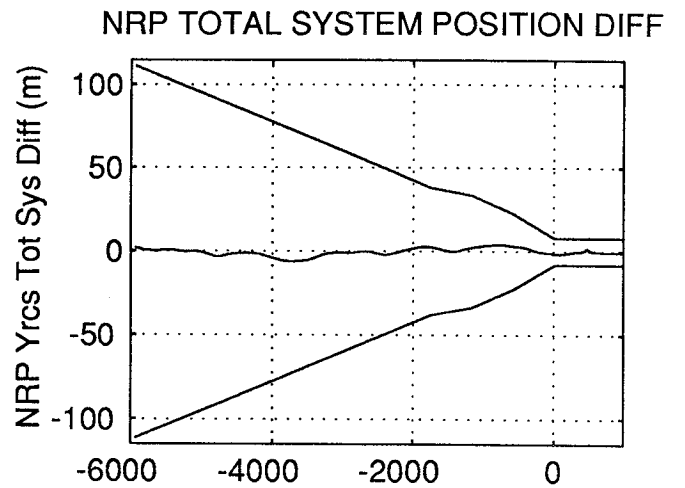
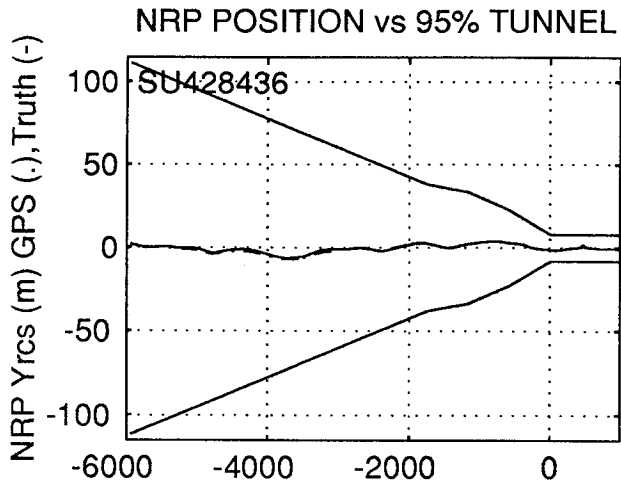
NRP Xrcs MEAN DIFFERENCE (m): 0.547
NRP Yrcs MEAN DIFFERENCE (m): -0.091
NRP Zrcs MEAN DIFFERENCE (m): 0.046

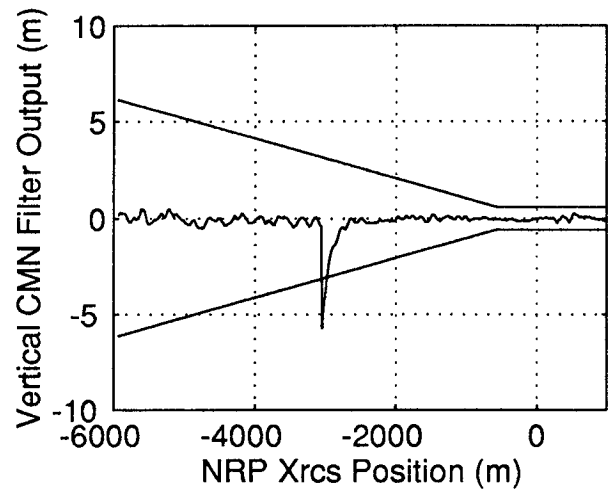
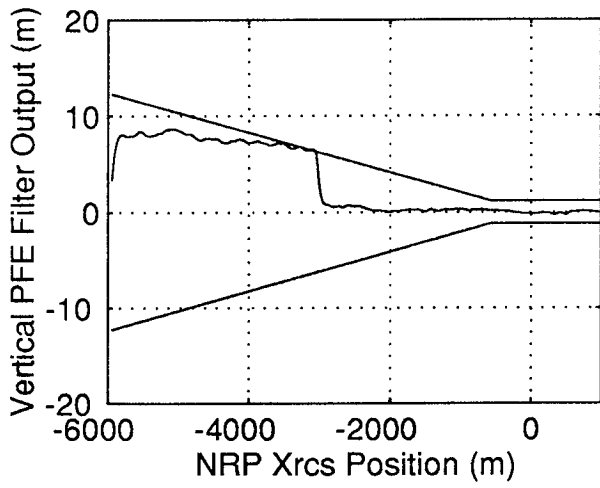
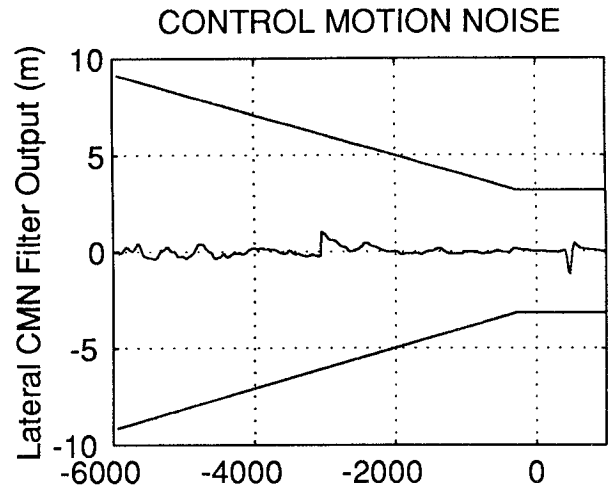
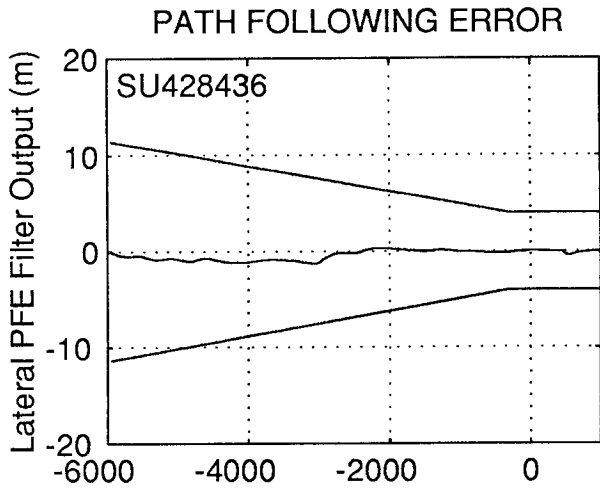
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.303
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.412
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.344

NRP Xrcs 2-RMS DIFFERENCE (m): 1.135
NRP Yrcs 2-RMS DIFFERENCE (m): 0.450
NRP Zrcs 2-RMS DIFFERENCE (m): 0.357

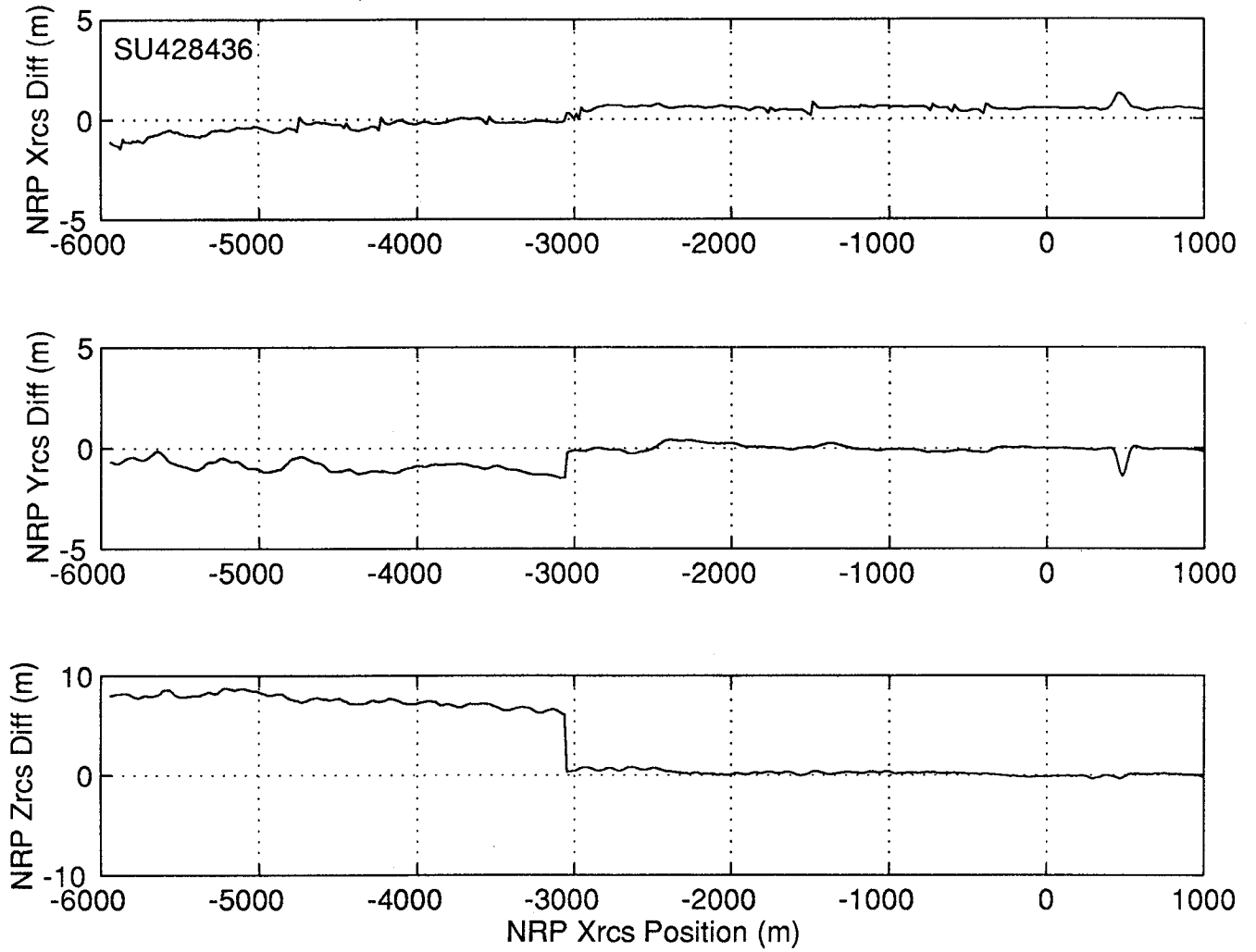
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 206.275
LGRP Yrcs POSITION (m): -0.372





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428438
START TIME: 243149.749
STOP TIME: 243268.999

MINIMUM HDOP: 3.4
MAXIMUM HDOP: 3.5
AVERAGE HDOP: 3.4

MINIMUM VDOP: 6.4
MAXIMUM VDOP: 6.6
AVERAGE VDOP: 6.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.492
NRP Yrcs MEAN DIFFERENCE (m): -0.038
NRP Zrcs MEAN DIFFERENCE (m): -0.061

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.243
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.193
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.284

NRP Xrcs 2-RMS DIFFERENCE (m): 1.014
NRP Yrcs 2-RMS DIFFERENCE (m): 0.208
NRP Zrcs 2-RMS DIFFERENCE (m): 0.309

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 196.259
LGRP Yrcs POSITION (m): -1.026

APPROACH #: SU428438
START TIME: 243149.749
STOP TIME: 243268.999

MINIMUM HDOP: 3.4
MAXIMUM HDOP: 3.5
AVERAGE HDOP: 3.4

MINIMUM VDOP: 6.4
MAXIMUM VDOP: 6.6
AVERAGE VDOP: 6.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

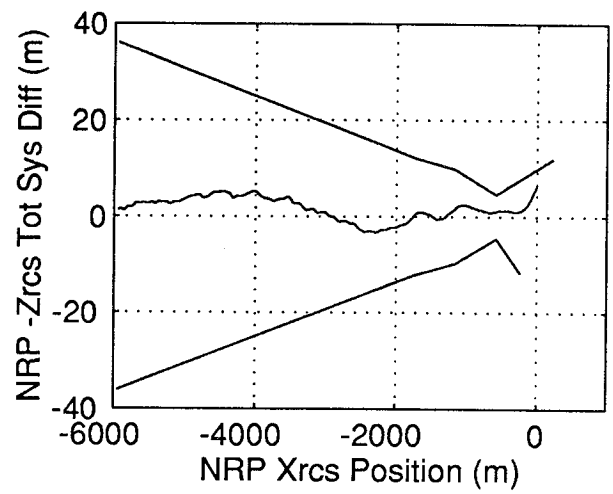
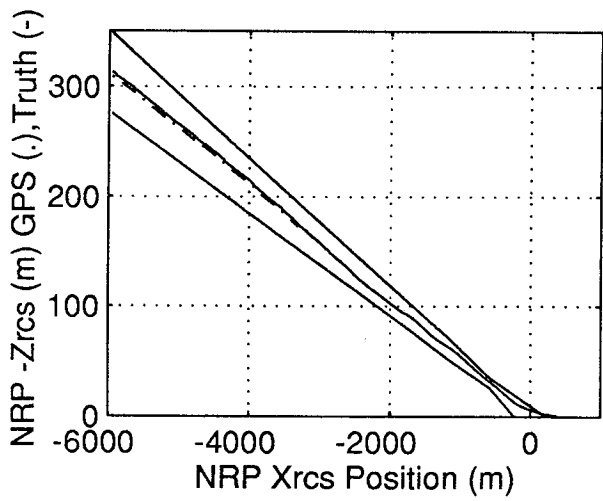
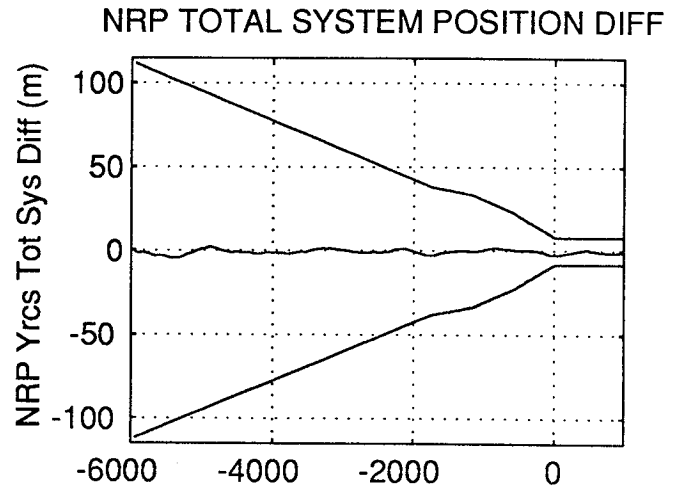
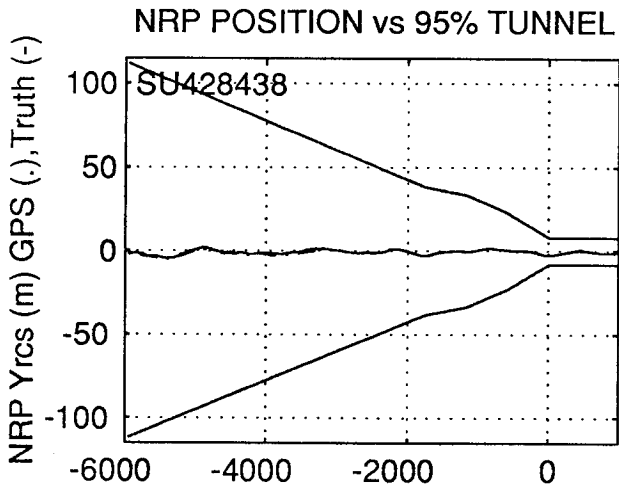
NRP Xrcs MEAN DIFFERENCE (m): 0.492
NRP Yrcs MEAN DIFFERENCE (m): -0.038
NRP Zrcs MEAN DIFFERENCE (m): -0.061

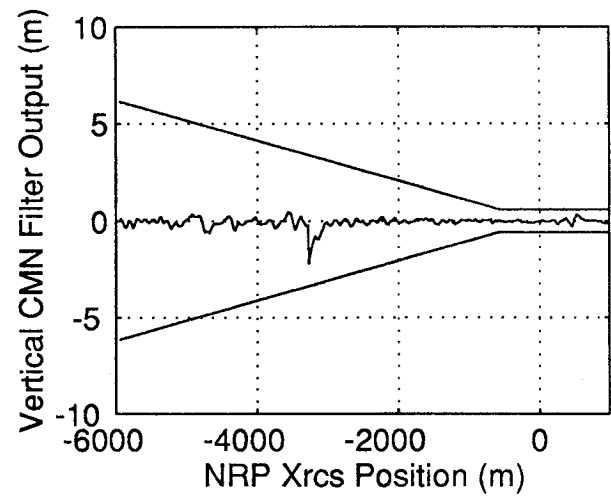
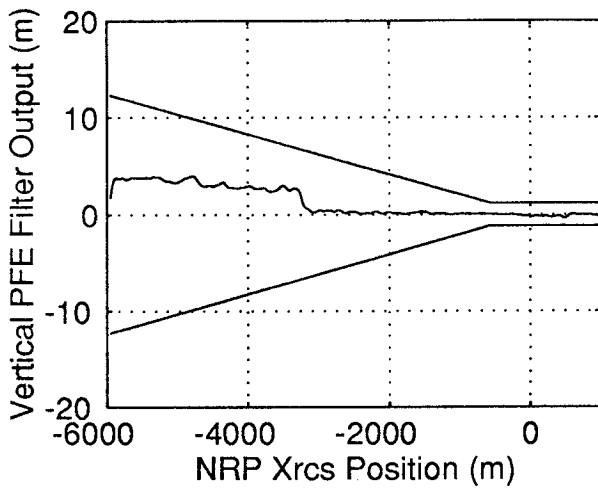
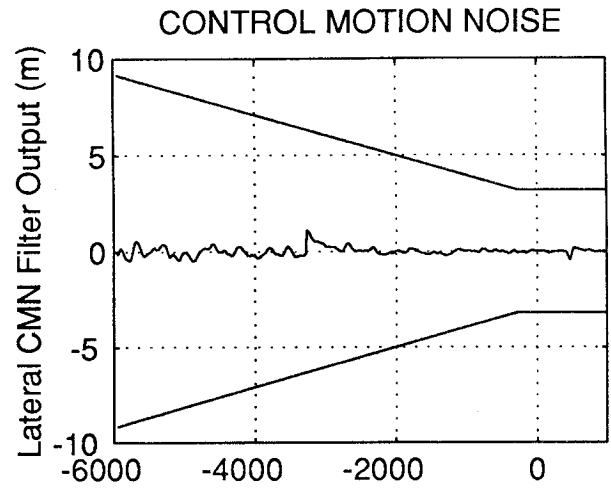
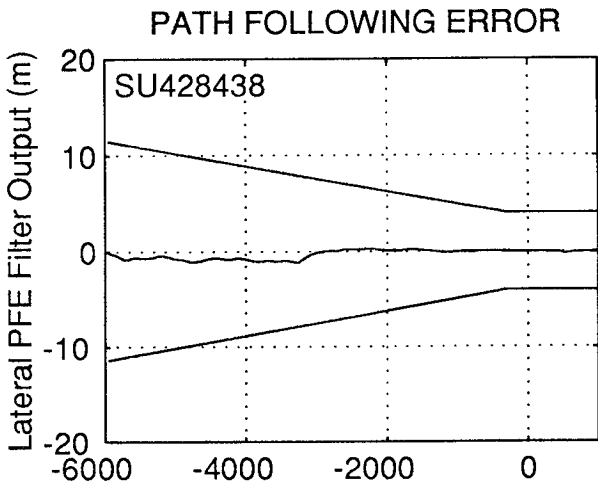
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.243
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.193
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.284

NRP Xrcs 2-RMS DIFFERENCE (m): 1.014
NRP Yrcs 2-RMS DIFFERENCE (m): 0.208
NRP Zrcs 2-RMS DIFFERENCE (m): 0.309

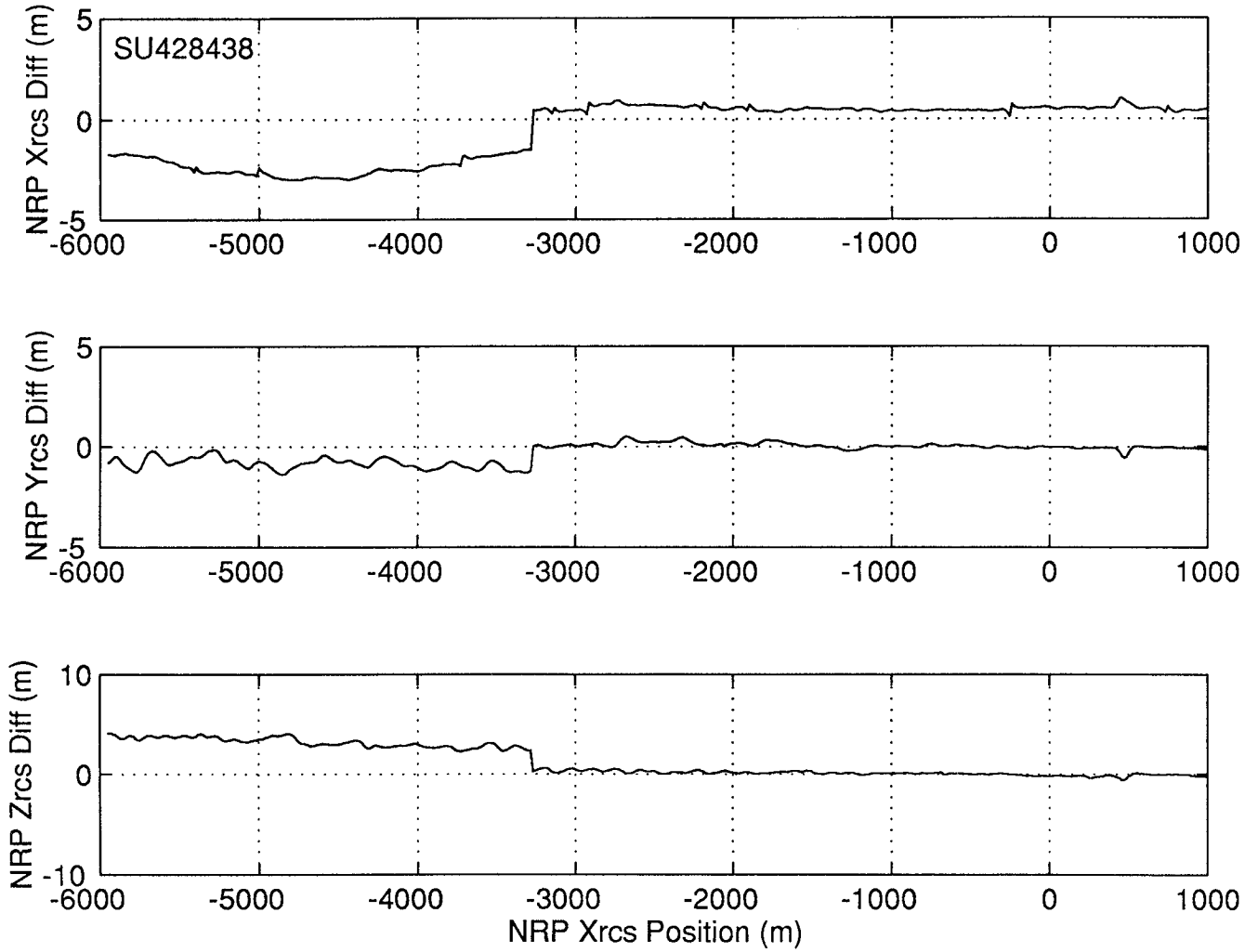
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 196.259
LGRP Yrcs POSITION (m): -1.026





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428440
START TIME: 243585.749
STOP TIME: 243702.999

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 3.7
AVERAGE HDOP: 3.7

MINIMUM VDOP: 7.2
MAXIMUM VDOP: 7.5
AVERAGE VDOP: 7.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.557
NRP Yrcs MEAN DIFFERENCE (m): -0.136
NRP Zrcs MEAN DIFFERENCE (m): 0.054

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.325
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.243
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.285

NRP Xrcs 2-RMS DIFFERENCE (m): 1.161
NRP Yrcs 2-RMS DIFFERENCE (m): 0.364
NRP Zrcs 2-RMS DIFFERENCE (m): 0.304

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 195.295
LGRP Yrcs POSITION (m): 0.297

APPROACH #: SU428440
START TIME: 243585.749
STOP TIME: 243702.999

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 3.7
AVERAGE HDOP: 3.7

MINIMUM VDOP: 7.2
MAXIMUM VDOP: 7.5
AVERAGE VDOP: 7.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

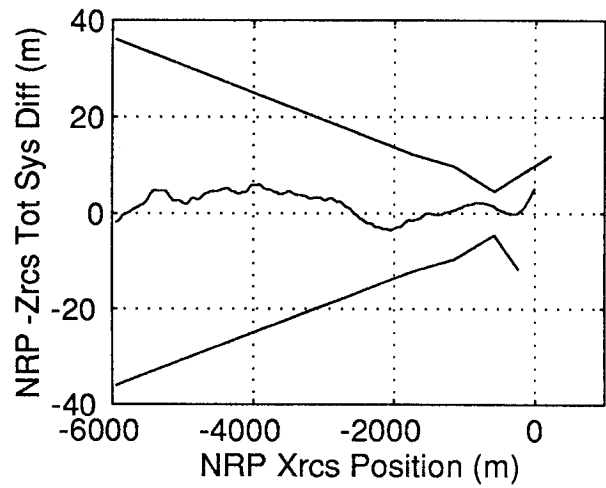
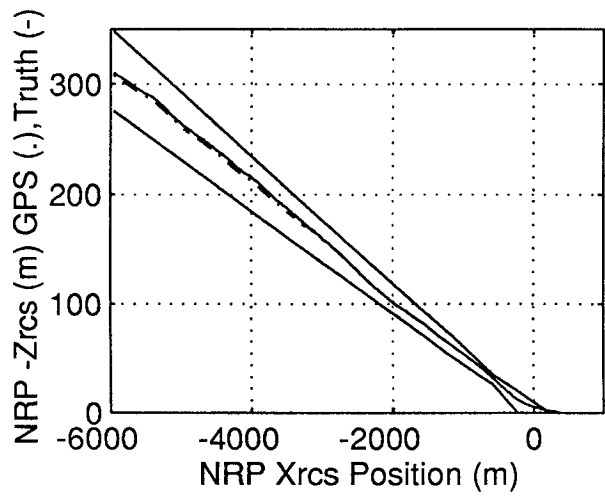
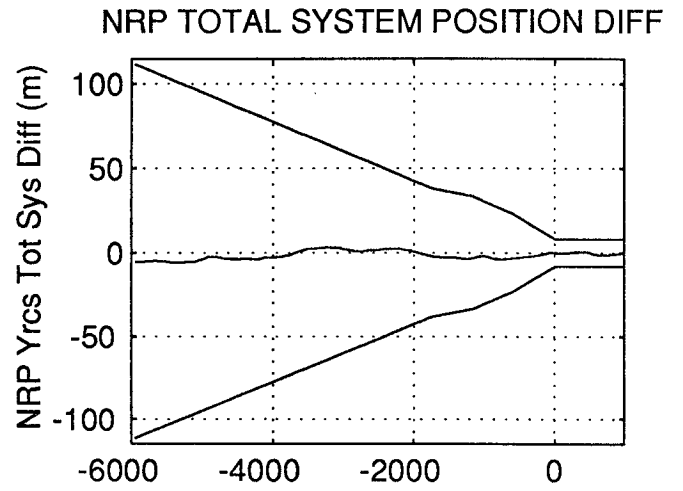
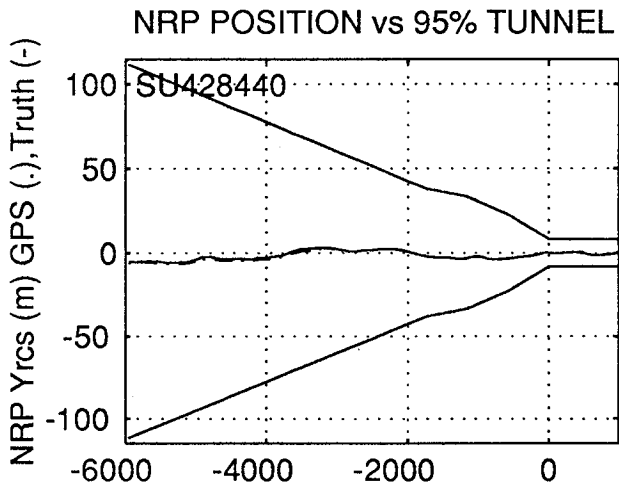
NRP Xrcs MEAN DIFFERENCE (m): 0.557
NRP Yrcs MEAN DIFFERENCE (m): -0.136
NRP Zrcs MEAN DIFFERENCE (m): 0.054

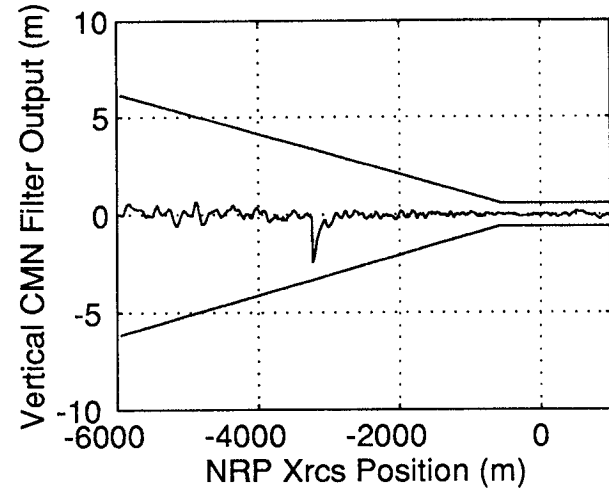
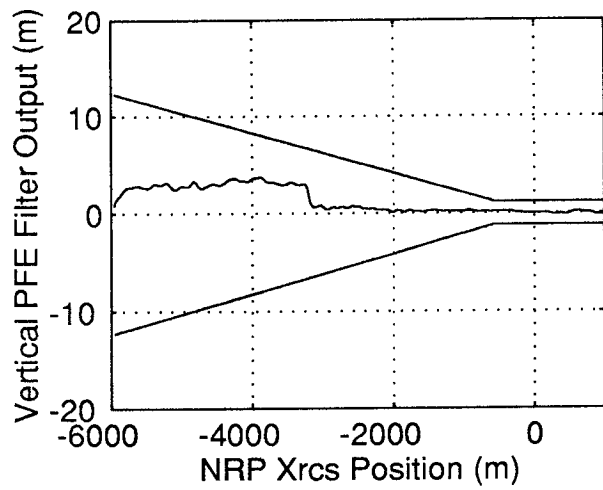
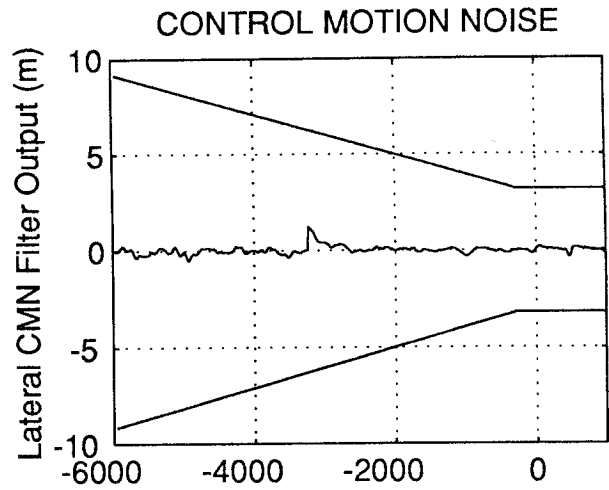
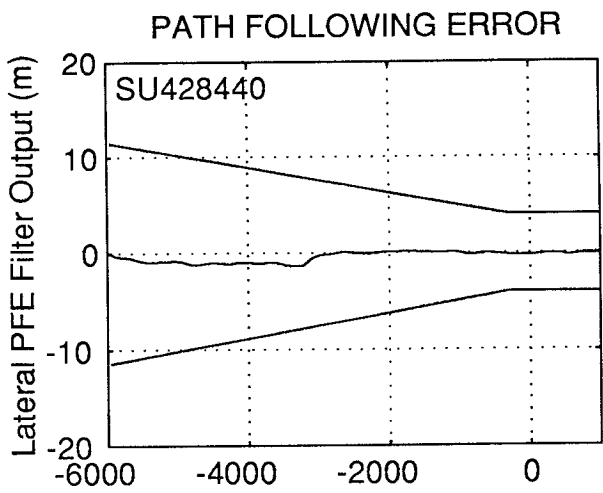
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.325
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.243
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.285

NRP Xrcs 2-RMS DIFFERENCE (m): 1.161
NRP Yrcs 2-RMS DIFFERENCE (m): 0.364
NRP Zrcs 2-RMS DIFFERENCE (m): 0.304

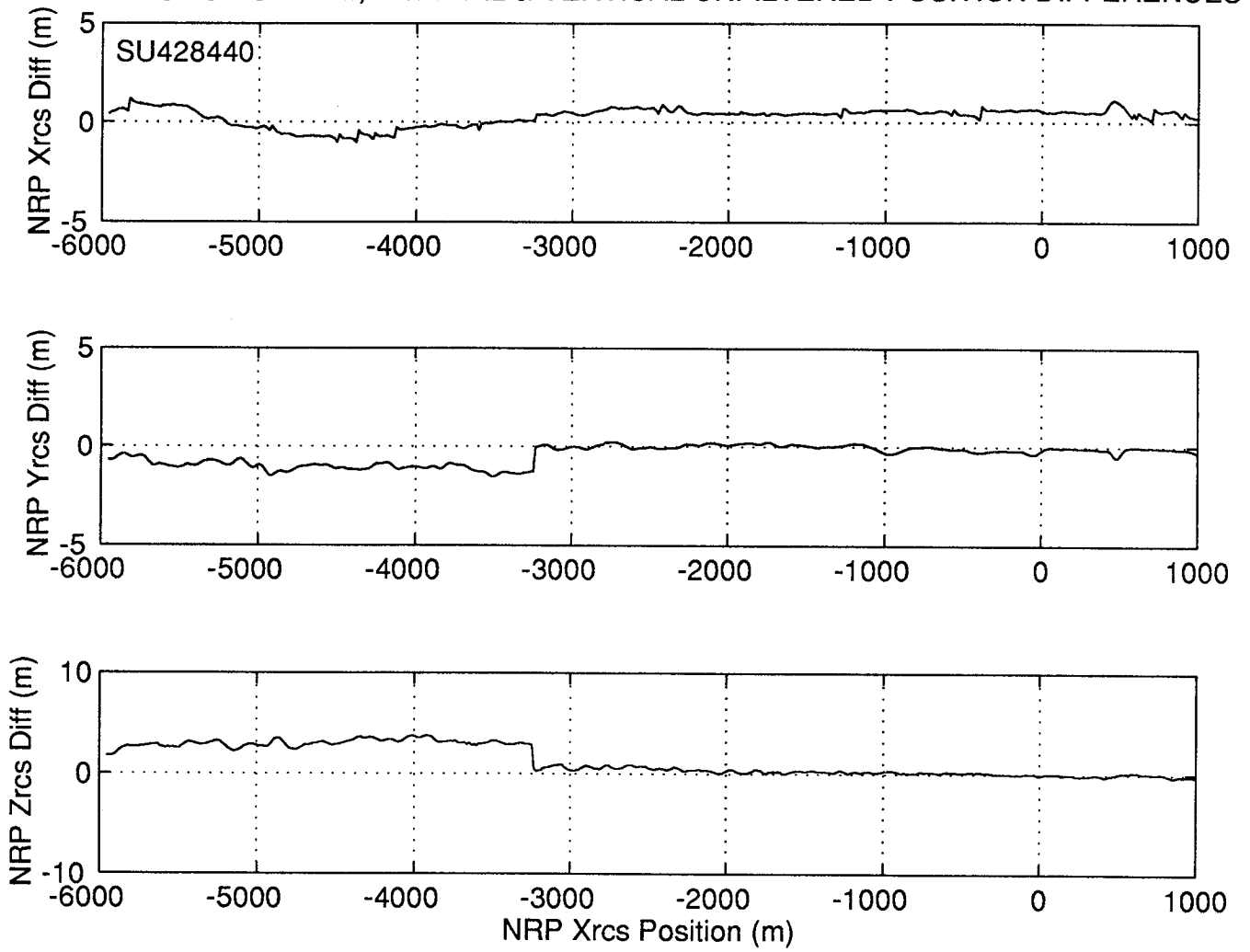
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 195.295
LGRP Yrcs POSITION (m): 0.297





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428442
START TIME: 243992.999
STOP TIME: 244106.749

MINIMUM HDOP: 3.9
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.3
MAXIMUM VDOP: 8.6
AVERAGE VDOP: 8.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.554
NRP Yrcs MEAN DIFFERENCE (m): -0.148
NRP Zrcs MEAN DIFFERENCE (m): -0.078

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.369
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.278
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.255

NRP Xrcs 2-RMS DIFFERENCE (m): 1.168
NRP Yrcs 2-RMS DIFFERENCE (m): 0.406
NRP Zrcs 2-RMS DIFFERENCE (m): 0.299

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 156.582
LGRP Yrcs POSITION (m): -0.056

APPROACH #: SU428442
START TIME: 243992.999
STOP TIME: 244106.749

MINIMUM HDOP: 3.9
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.3
MAXIMUM VDOP: 8.6
AVERAGE VDOP: 8.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

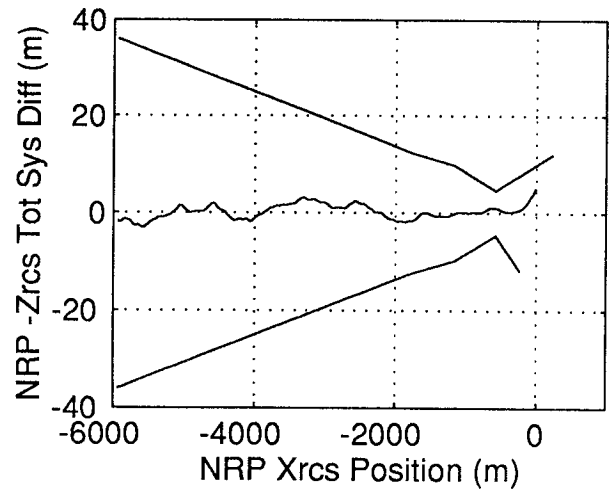
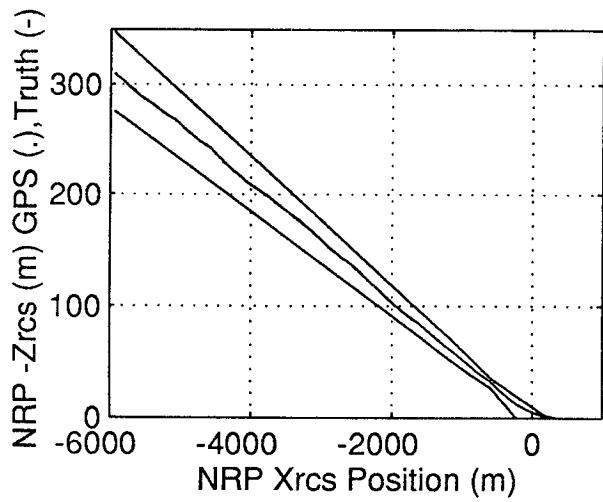
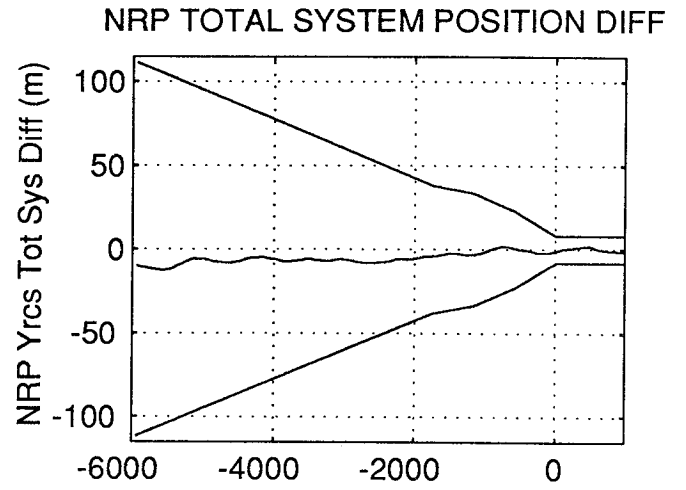
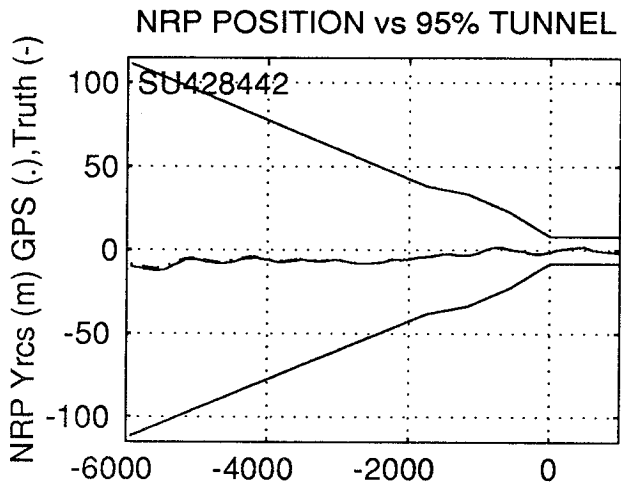
NRP Xrcs MEAN DIFFERENCE (m): 0.554
NRP Yrcs MEAN DIFFERENCE (m): -0.148
NRP Zrcs MEAN DIFFERENCE (m): -0.078

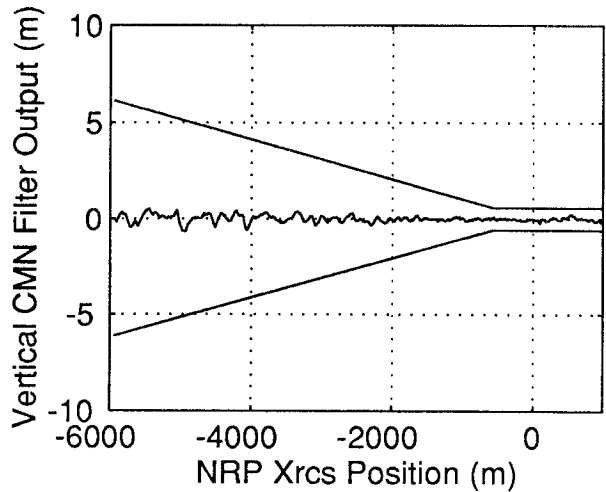
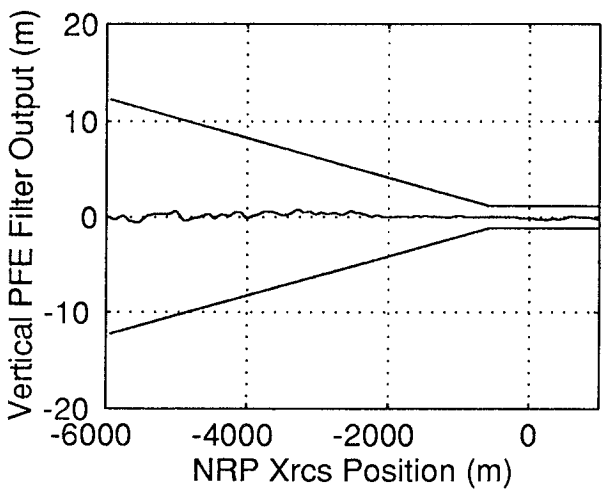
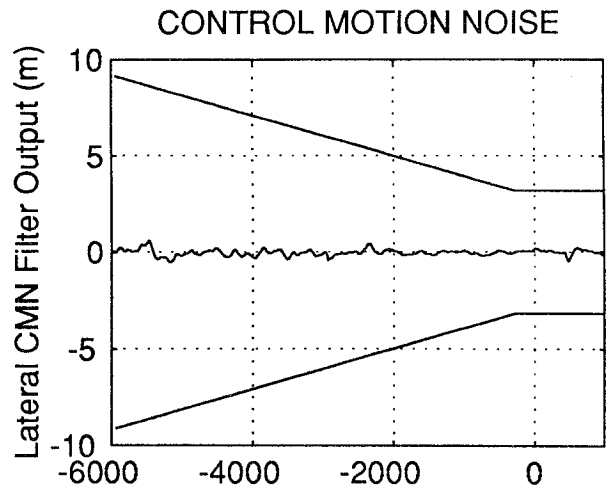
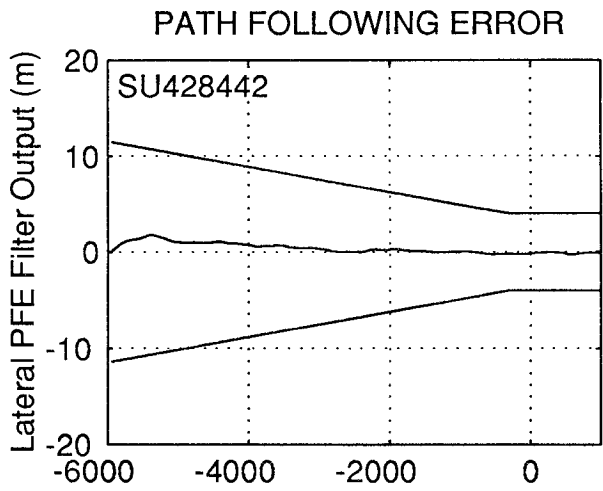
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.369
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.278
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.255

NRP Xrcs 2-RMS DIFFERENCE (m): 1.168
NRP Yrcs 2-RMS DIFFERENCE (m): 0.406
NRP Zrcs 2-RMS DIFFERENCE (m): 0.299

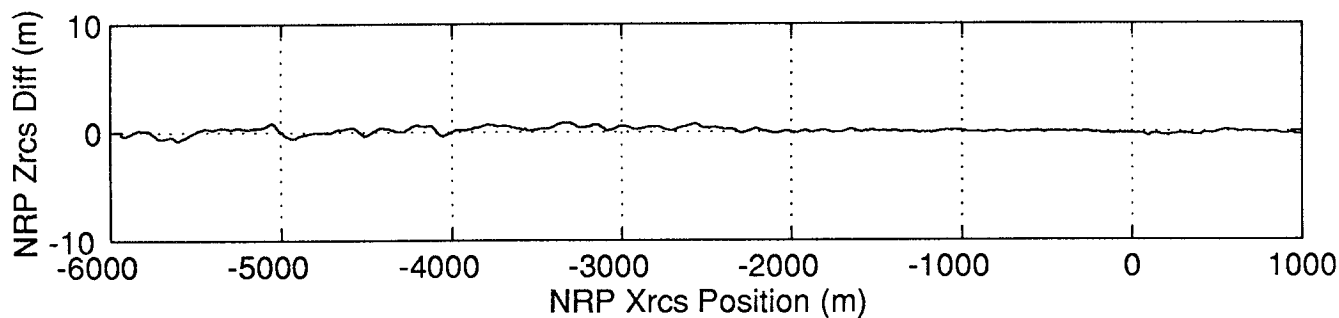
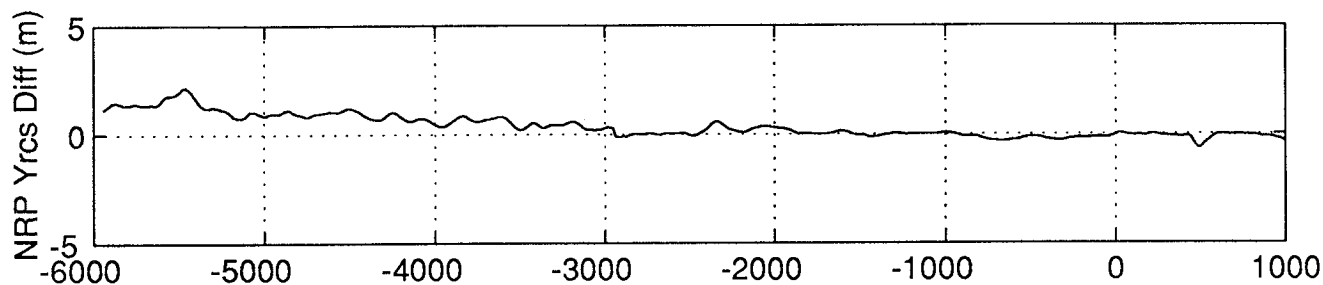
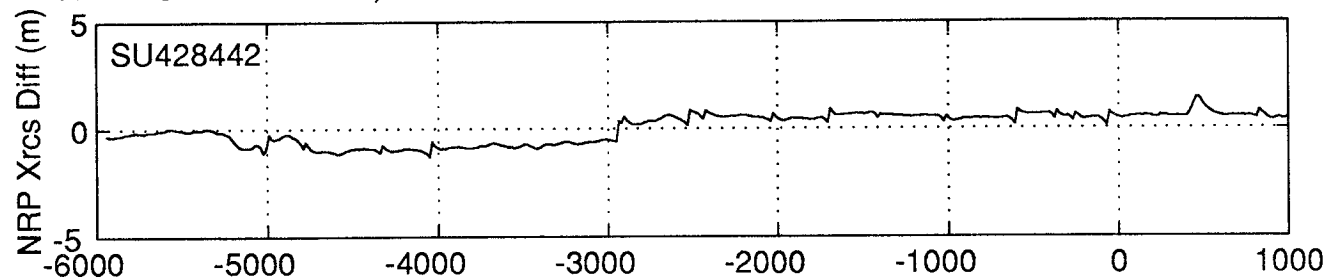
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 156.582
LGRP Yrcs POSITION (m): -0.056





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428444
START TIME: 244410.249
STOP TIME: 244526.999

MINIMUM HDOP: 4.1
MAXIMUM HDOP: 4.1
AVERAGE HDOP: 4.1

MINIMUM VDOP: 9.5
MAXIMUM VDOP: 9.7
AVERAGE VDOP: 9.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.545
NRP Yrcs MEAN DIFFERENCE (m): -0.062
NRP Zrcs MEAN DIFFERENCE (m): -0.001

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.333
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.250
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.290

NRP Xrcs 2-RMS DIFFERENCE (m): 1.140
NRP Yrcs 2-RMS DIFFERENCE (m): 0.279
NRP Zrcs 2-RMS DIFFERENCE (m): 0.290

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 205.175
LGRP Yrcs POSITION (m): -2.959

APPROACH #: SU428444
START TIME: 244410.249
STOP TIME: 244526.999

MINIMUM HDOP: 4.1
MAXIMUM HDOP: 4.1
AVERAGE HDOP: 4.1

MINIMUM VDOP: 9.5
MAXIMUM VDOP: 9.7
AVERAGE VDOP: 9.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

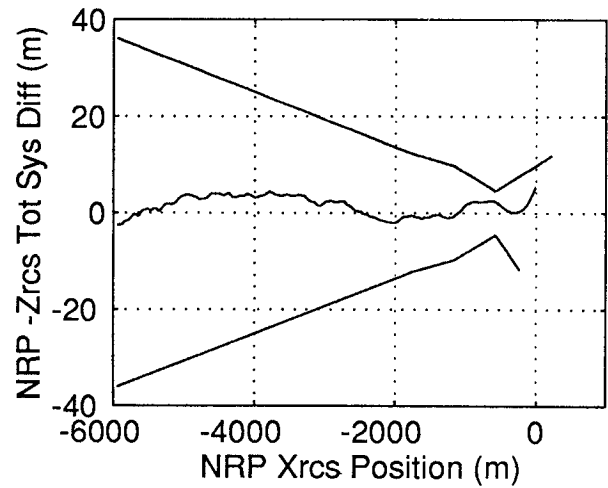
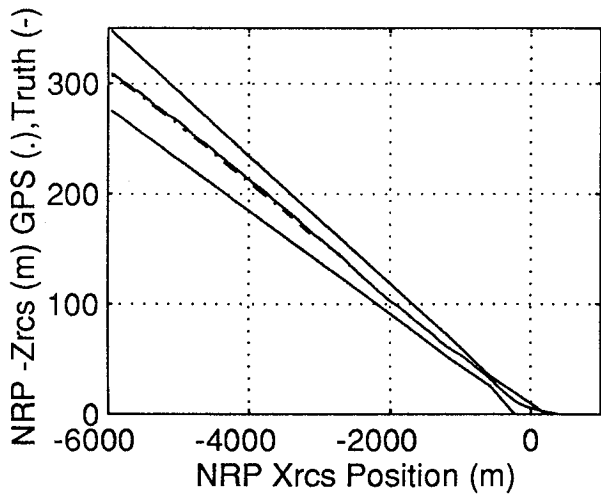
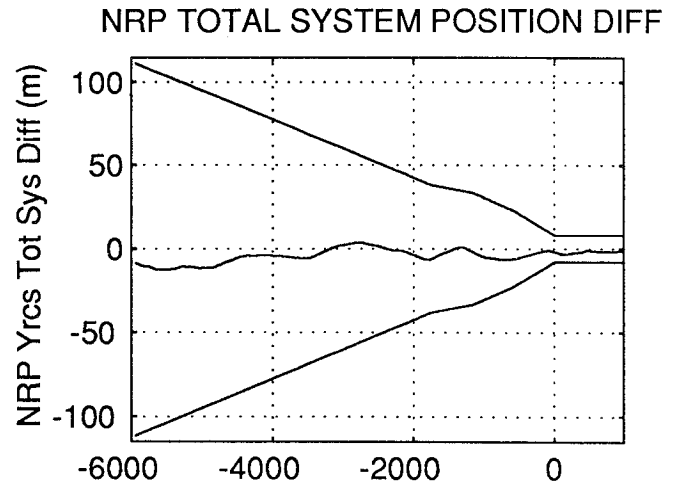
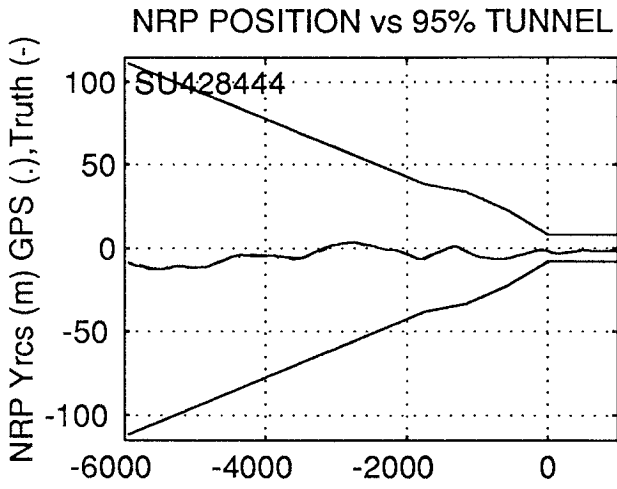
NRP Xrcs MEAN DIFFERENCE (m): 0.545
NRP Yrcs MEAN DIFFERENCE (m): -0.062
NRP Zrcs MEAN DIFFERENCE (m): -0.001

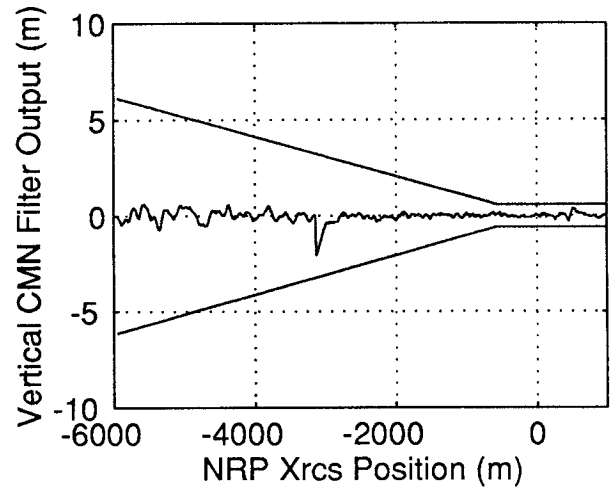
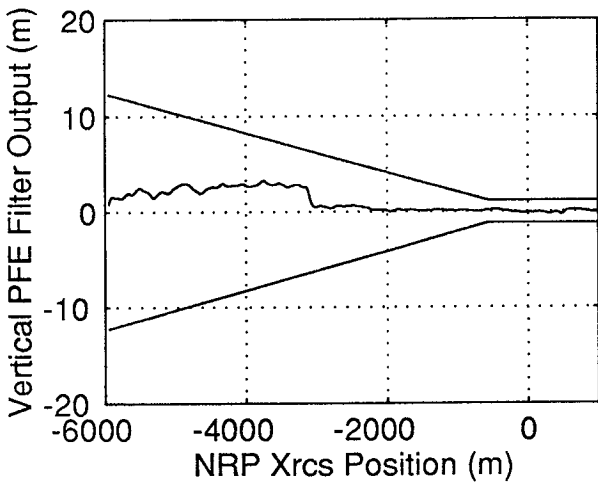
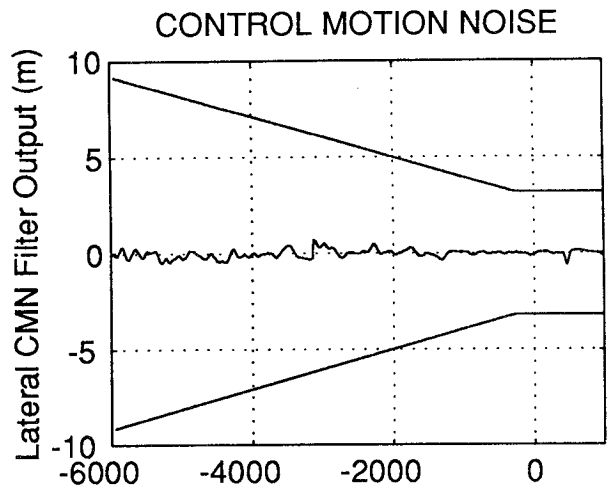
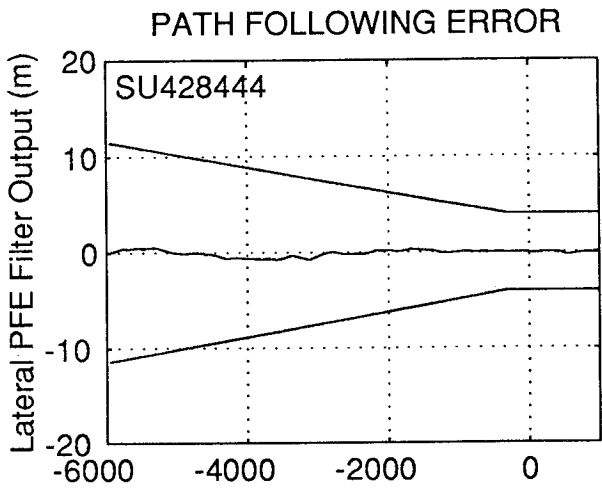
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.333
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.250
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.290

NRP Xrcs 2-RMS DIFFERENCE (m): 1.140
NRP Yrcs 2-RMS DIFFERENCE (m): 0.279
NRP Zrcs 2-RMS DIFFERENCE (m): 0.290

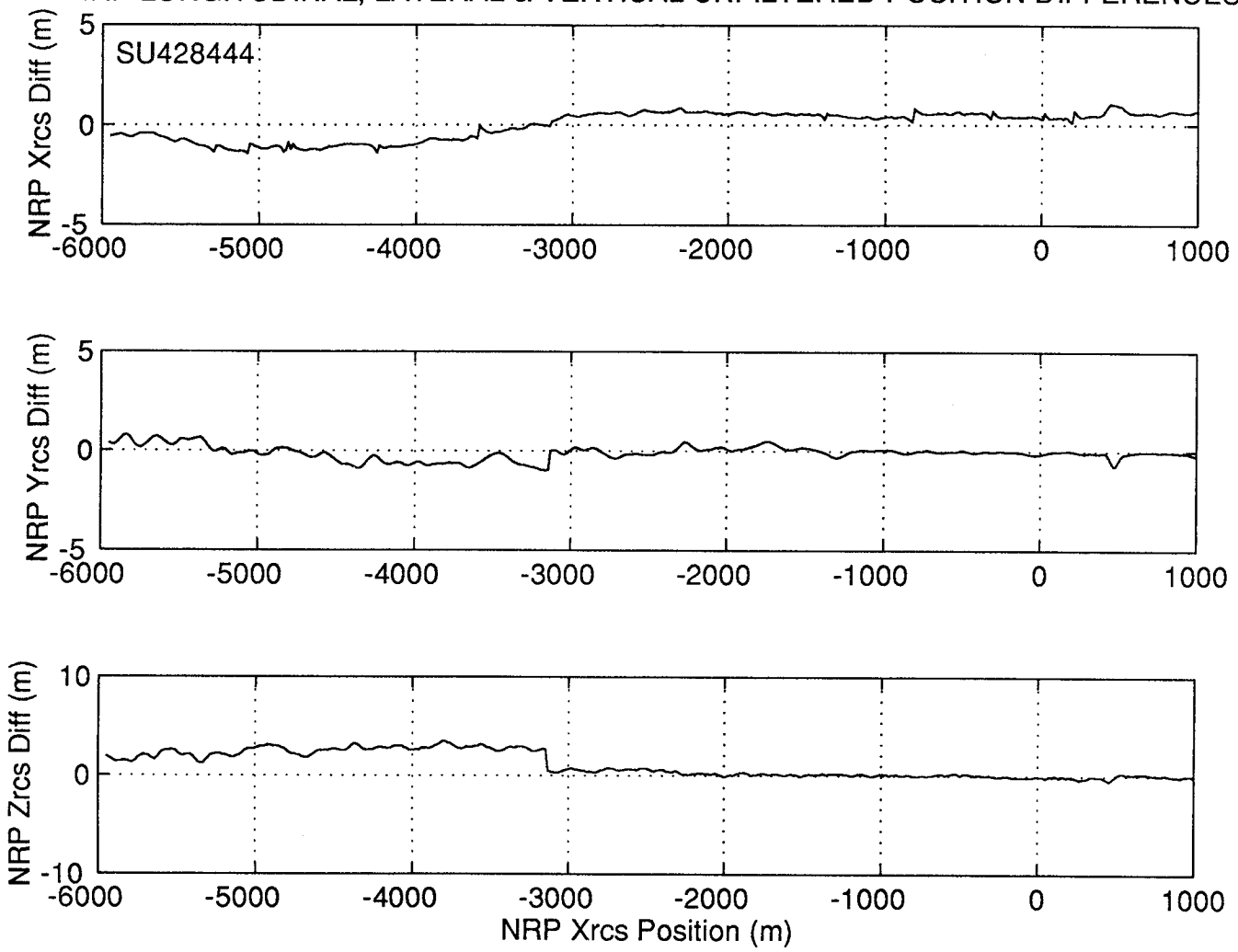
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 205.175
LGRP Yrcs POSITION (m): -2.959





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428446
START TIME: 244827.999
STOP TIME: 244944.249

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 10.3
MAXIMUM VDOP: 10.4
AVERAGE VDOP: 10.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.562
NRP Yrcs MEAN DIFFERENCE (m): -0.209
NRP Zrcs MEAN DIFFERENCE (m): 0.123

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.423
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.362
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.361

NRP Xrcs 2-RMS DIFFERENCE (m): 1.202
NRP Yrcs 2-RMS DIFFERENCE (m): 0.553
NRP Zrcs 2-RMS DIFFERENCE (m): 0.436

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 151.191
LGRP Yrcs POSITION (m): 3.015

APPROACH #: SU428446
START TIME: 244827.999
STOP TIME: 244944.249

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 10.3
MAXIMUM VDOP: 10.4
AVERAGE VDOP: 10.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

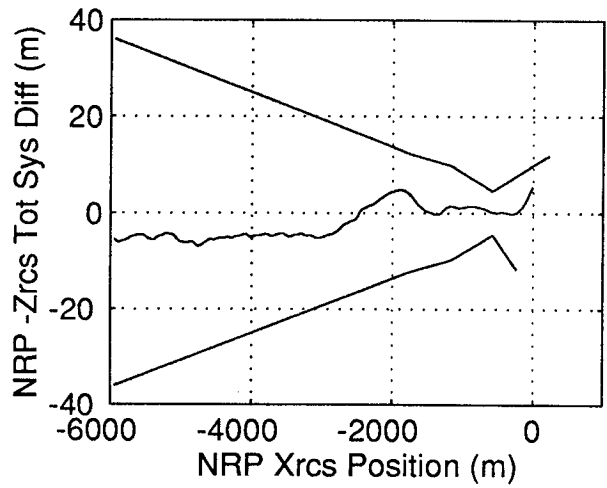
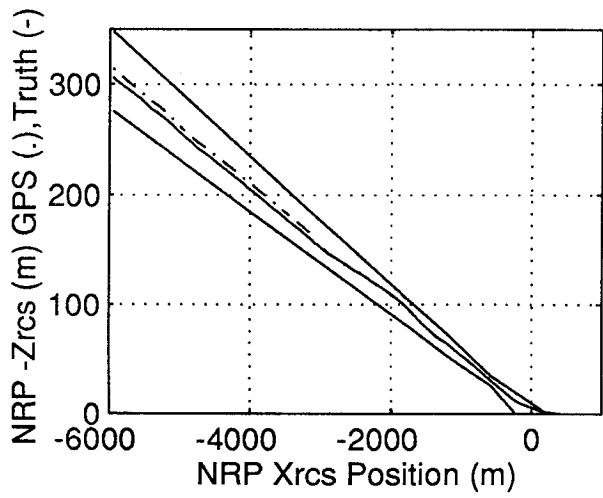
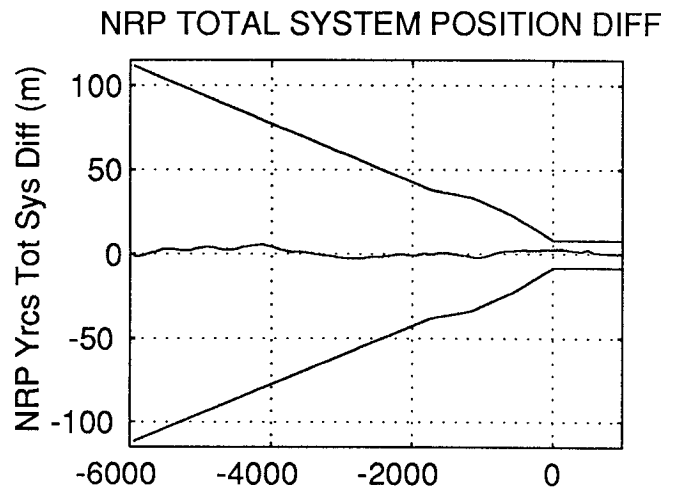
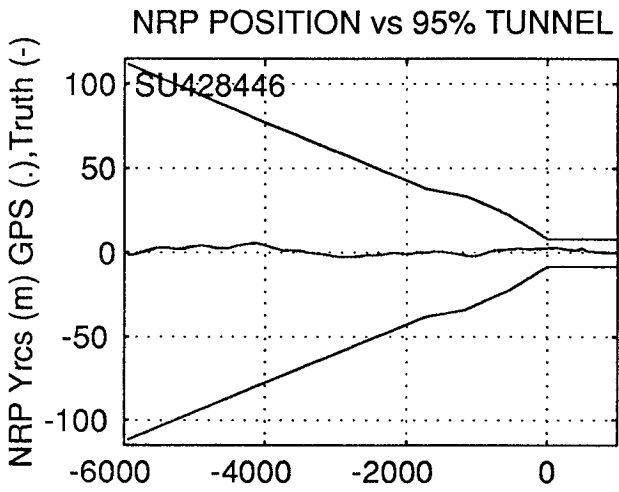
NRP Xrcs MEAN DIFFERENCE (m): 0.562
NRP Yrcs MEAN DIFFERENCE (m): -0.209
NRP Zrcs MEAN DIFFERENCE (m): 0.123

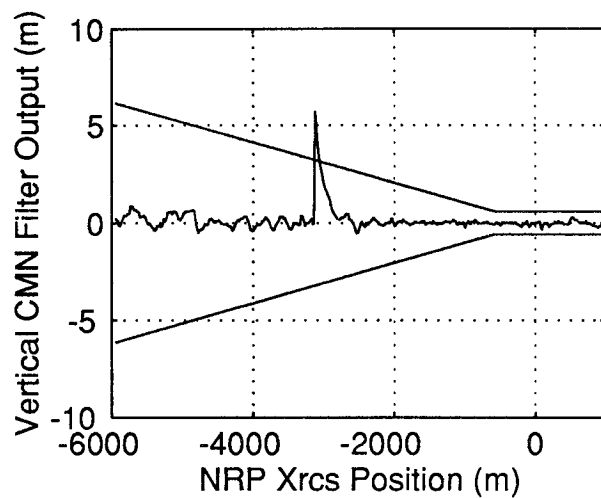
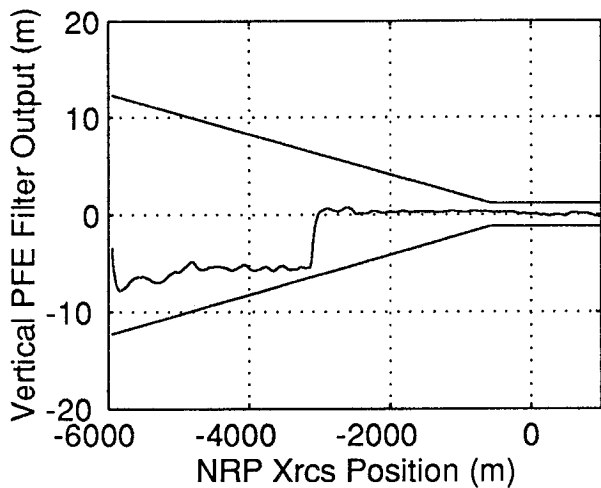
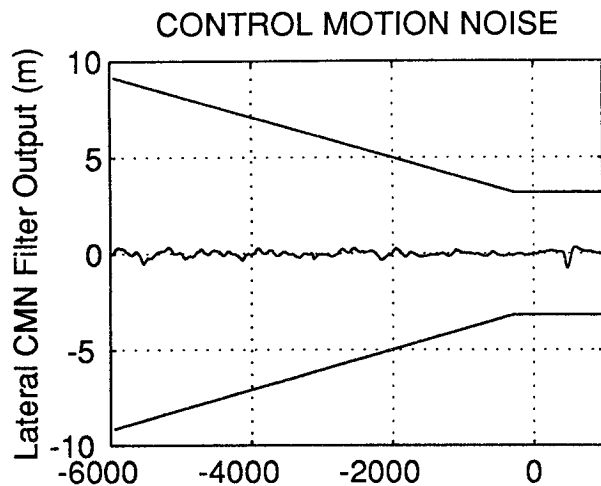
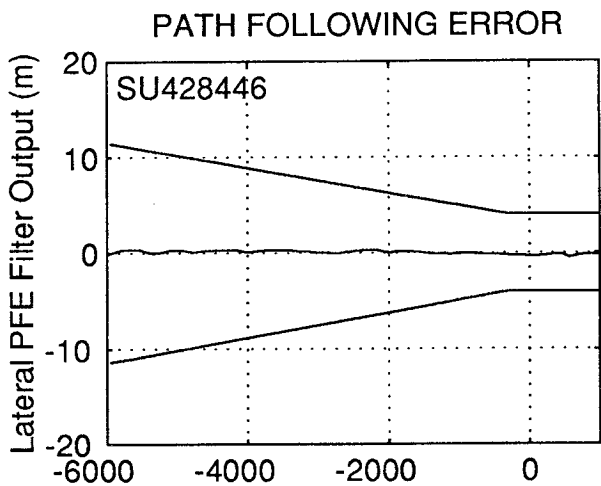
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.423
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.362
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.361

NRP Xrcs 2-RMS DIFFERENCE (m): 1.202
NRP Yrcs 2-RMS DIFFERENCE (m): 0.553
NRP Zrcs 2-RMS DIFFERENCE (m): 0.436

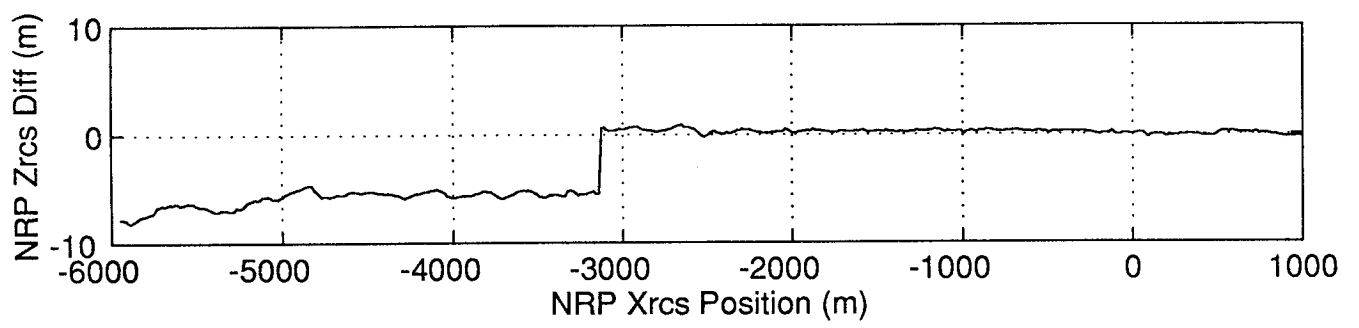
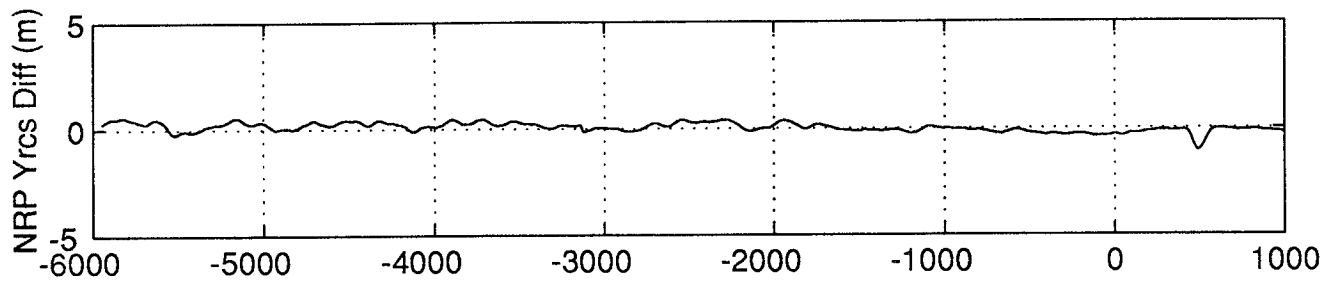
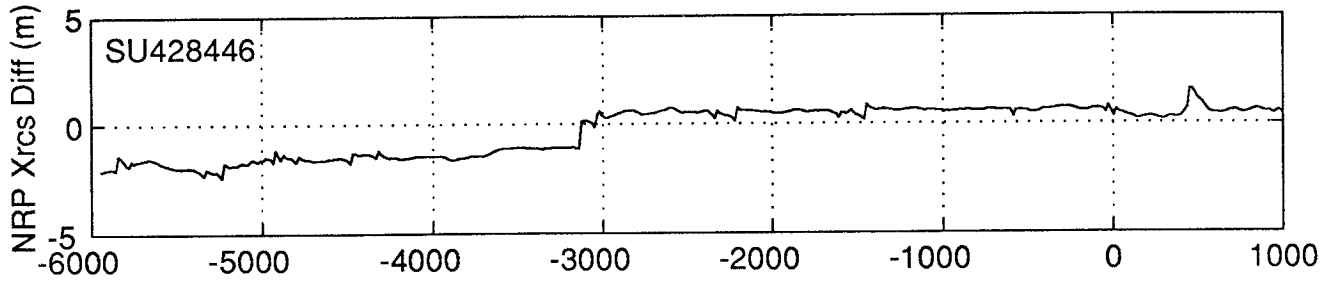
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 151.191
LGRP Yrcs POSITION (m): 3.015





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428448
START TIME: 245219.999
STOP TIME: 245342.249

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.1

MINIMUM VDOP: 10.1
MAXIMUM VDOP: 10.3
AVERAGE VDOP: 10.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.514
NRP Yrcs MEAN DIFFERENCE (m): -0.185
NRP Zrcs MEAN DIFFERENCE (m): 0.212

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.262
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.298
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.191

NRP Xrcs 2-RMS DIFFERENCE (m): 1.061
NRP Yrcs 2-RMS DIFFERENCE (m): 0.475
NRP Zrcs 2-RMS DIFFERENCE (m): 0.466

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 297.099
LGRP Yrcs POSITION (m): 0.090

APPROACH #: SU428448
START TIME: 245219.999
STOP TIME: 245342.249

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.1

MINIMUM VDOP: 10.1
MAXIMUM VDOP: 10.3
AVERAGE VDOP: 10.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

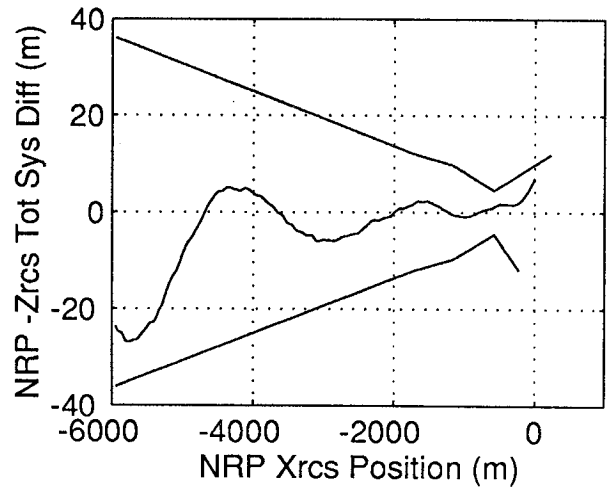
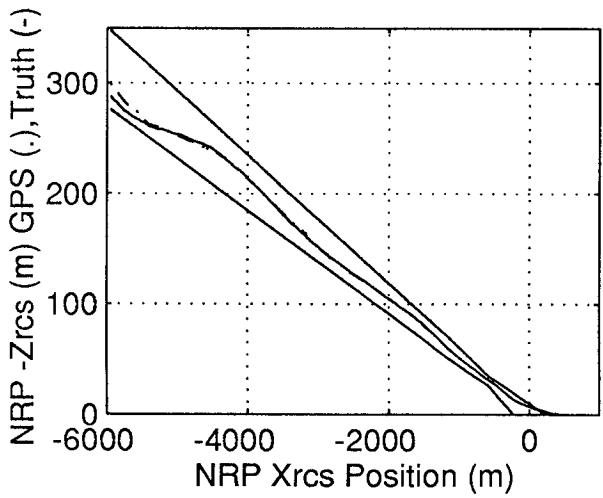
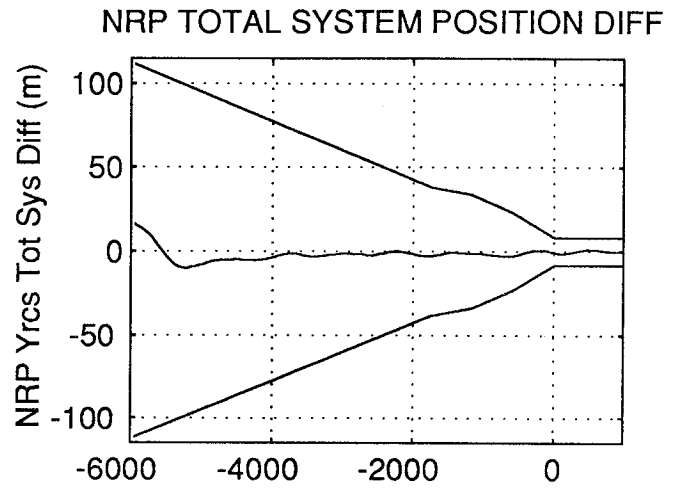
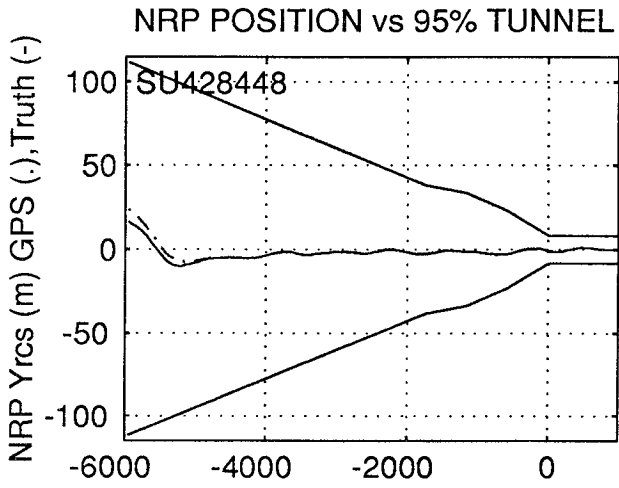
NRP Xrcs MEAN DIFFERENCE (m): 0.514
NRP Yrcs MEAN DIFFERENCE (m): -0.185
NRP Zrcs MEAN DIFFERENCE (m): 0.212

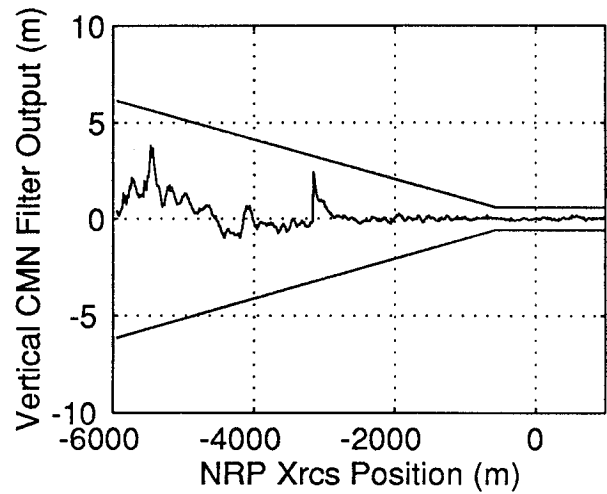
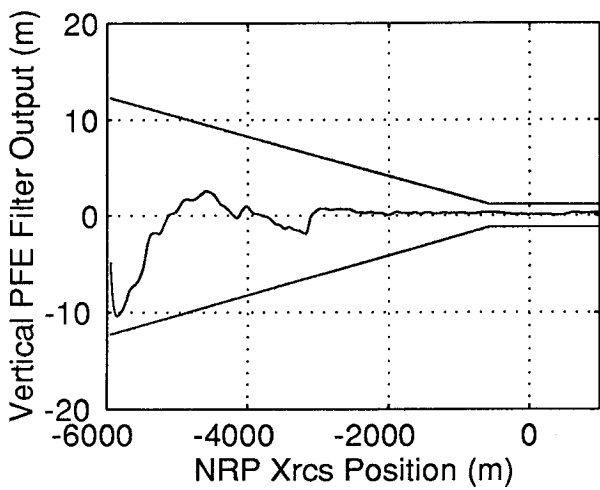
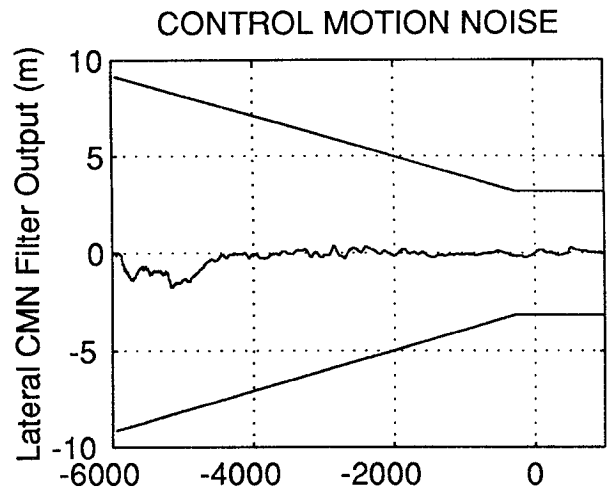
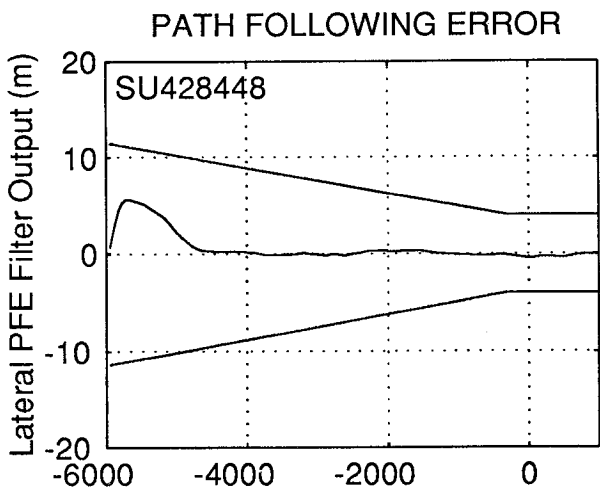
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.262
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.298
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.191

NRP Xrcs 2-RMS DIFFERENCE (m): 1.061
NRP Yrcs 2-RMS DIFFERENCE (m): 0.475
NRP Zrcs 2-RMS DIFFERENCE (m): 0.466

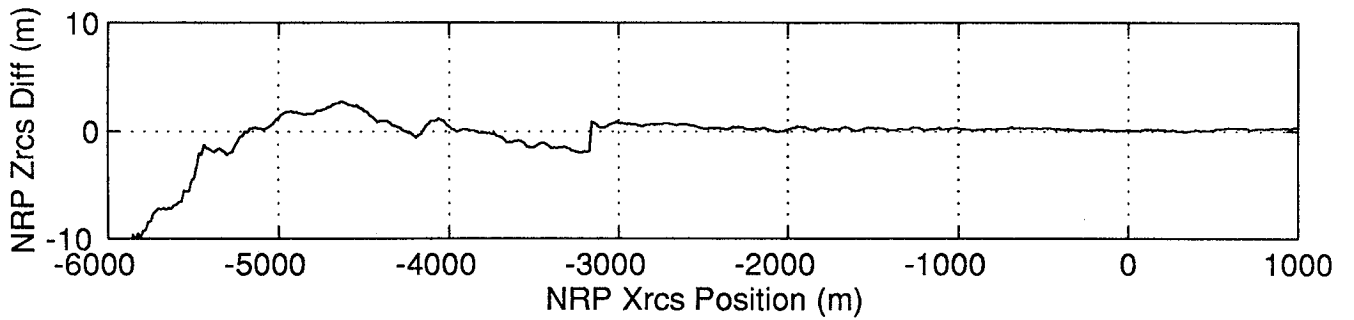
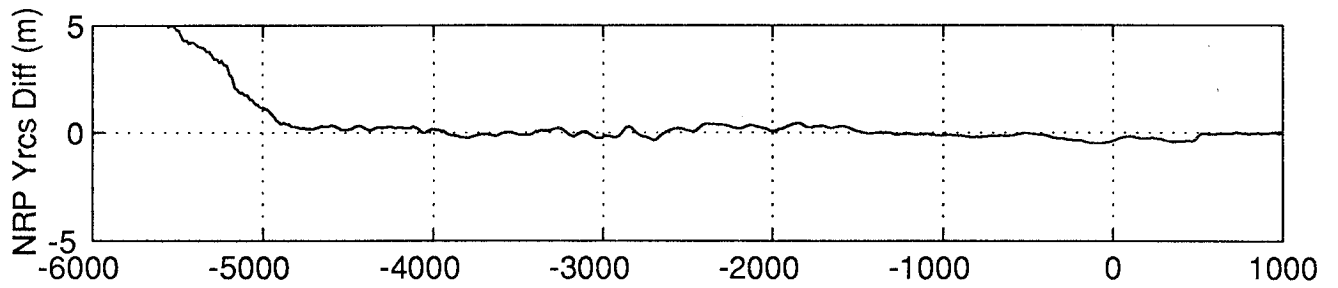
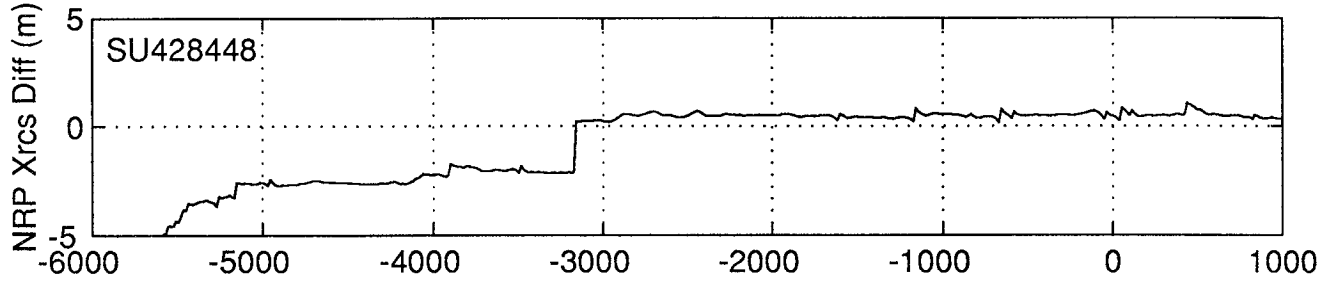
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 297.099
LGRP Yrcs POSITION (m): 0.090





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428452
START TIME: 246565.499
STOP TIME: 246679.499

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 6.7
MAXIMUM VDOP: 7.0
AVERAGE VDOP: 6.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.496
NRP Yrcs MEAN DIFFERENCE (m): -0.175
NRP Zrcs MEAN DIFFERENCE (m): -0.050

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.264
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.250
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.347

NRP Xrcs 2-RMS DIFFERENCE (m): 1.027
NRP Yrcs 2-RMS DIFFERENCE (m): 0.431
NRP Zrcs 2-RMS DIFFERENCE (m): 0.361

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 144.629
LGRP Yrcs POSITION (m): 0.942

APPROACH #: SU428452
START TIME: 246565.499
STOP TIME: 246679.499

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 6.7
MAXIMUM VDOP: 7.0
AVERAGE VDOP: 6.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

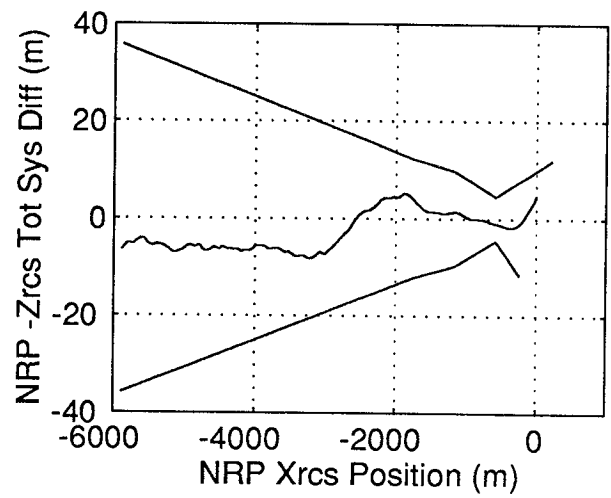
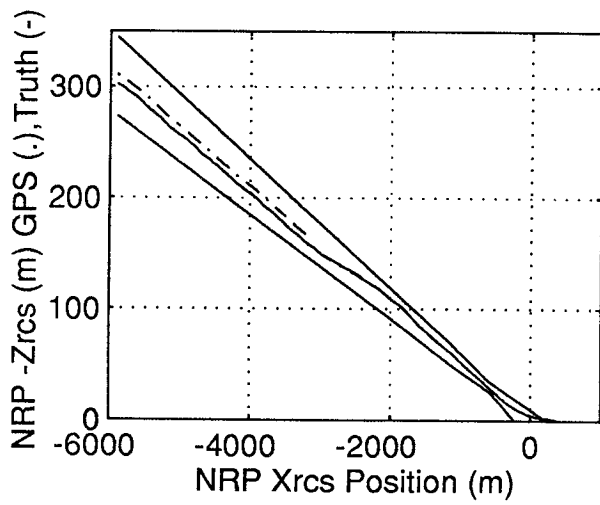
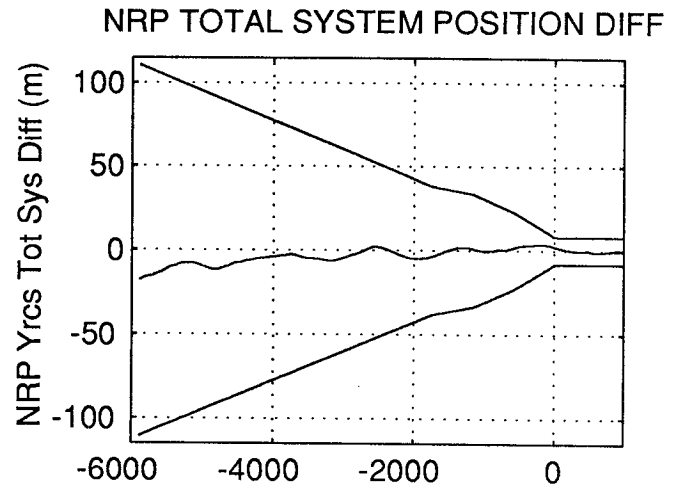
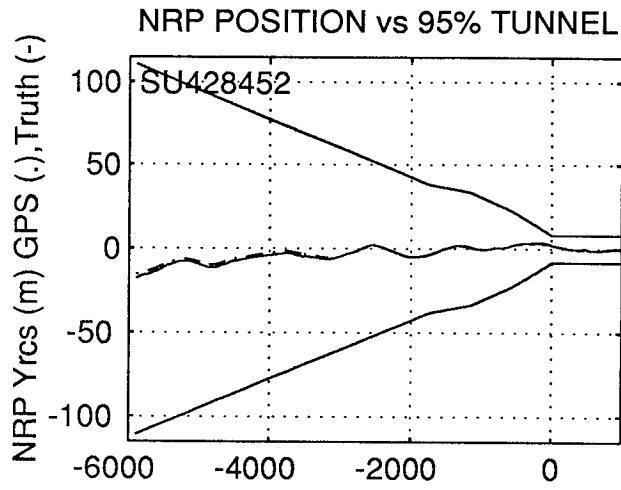
NRP Xrcs MEAN DIFFERENCE (m): 0.496
NRP Yrcs MEAN DIFFERENCE (m): -0.175
NRP Zrcs MEAN DIFFERENCE (m): -0.050

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.264
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.250
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.347

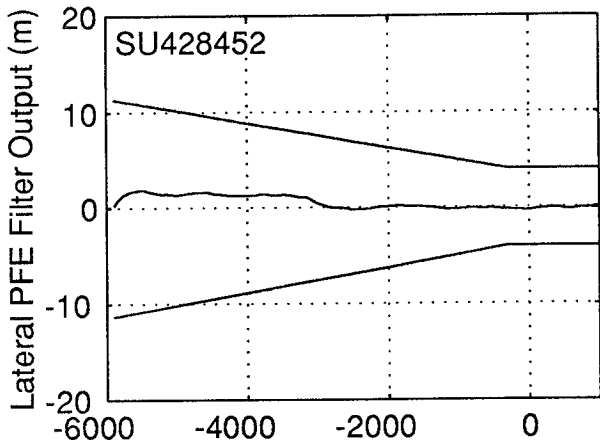
NRP Xrcs 2-RMS DIFFERENCE (m): 1.027
NRP Yrcs 2-RMS DIFFERENCE (m): 0.431
NRP Zrcs 2-RMS DIFFERENCE (m): 0.361

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

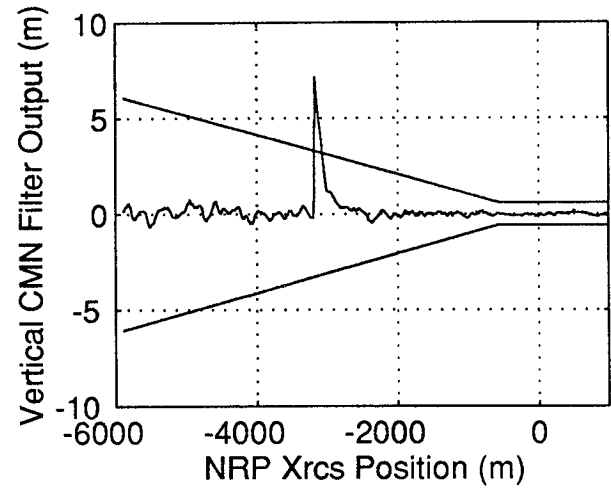
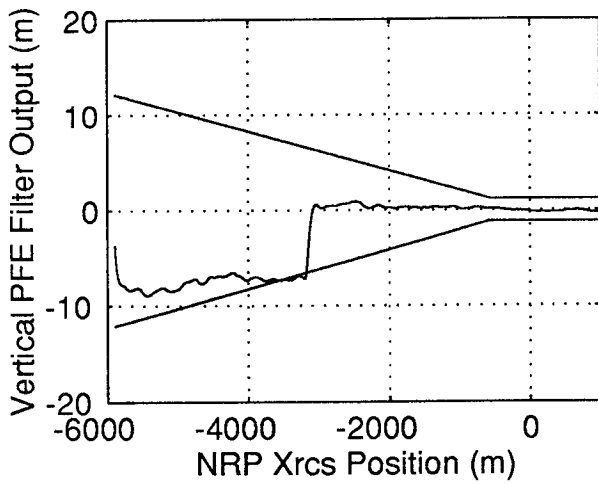
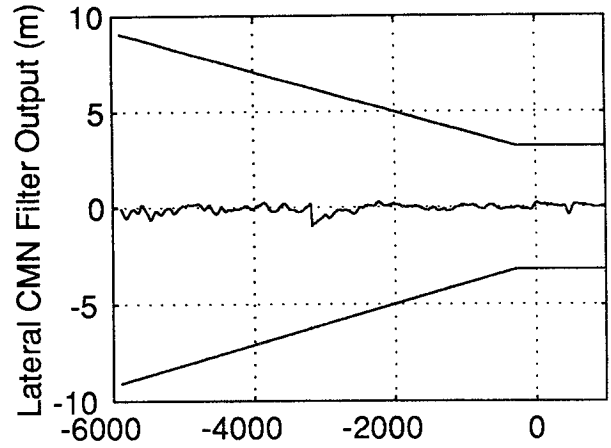
LGRP Xrcs POSITION (m): 144.629
LGRP Yrcs POSITION (m): 0.942



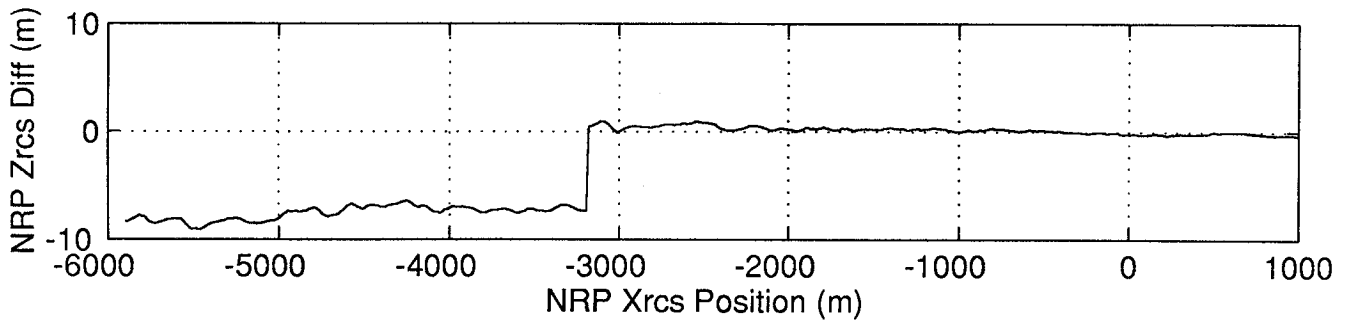
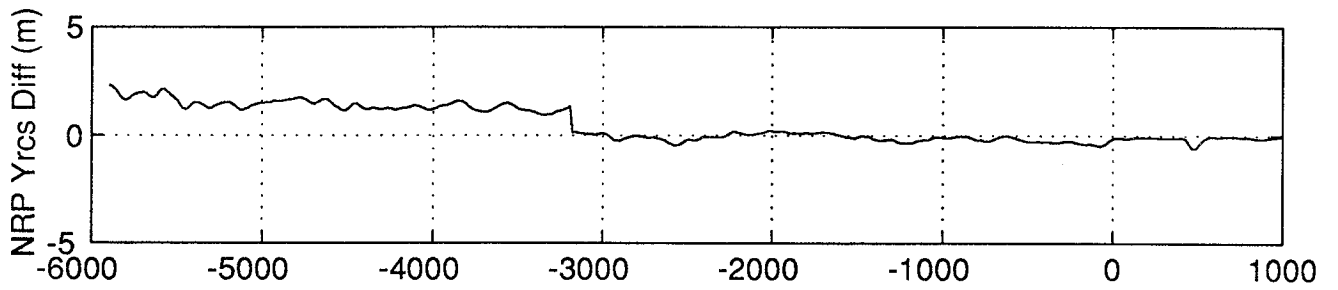
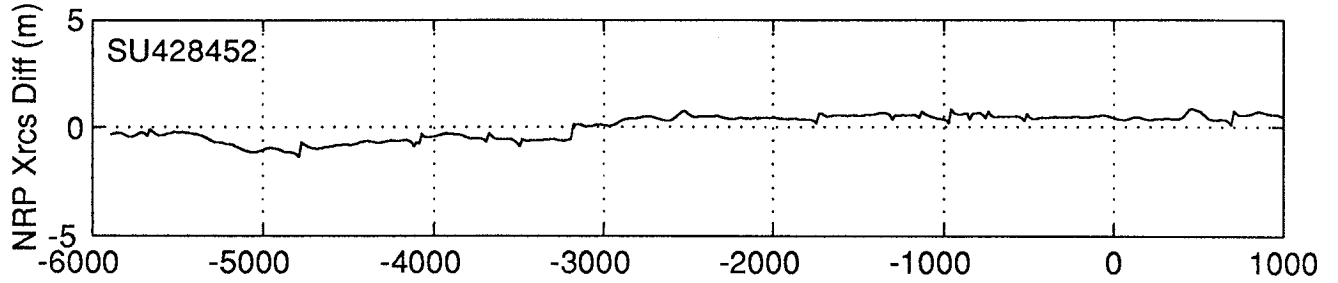
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428454
START TIME: 246991.999
STOP TIME: 247104.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 5.7
MAXIMUM VDOP: 5.9
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.385
NRP Yrcs MEAN DIFFERENCE (m): -0.234
NRP Zrcs MEAN DIFFERENCE (m): 0.067

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.245
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.289
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.248

NRP Xrcs 2-RMS DIFFERENCE (m): 0.807
NRP Yrcs 2-RMS DIFFERENCE (m): 0.550
NRP Zrcs 2-RMS DIFFERENCE (m): 0.281

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 81.102
LGRP Yrcs POSITION (m): 2.946

APPROACH #: SU428454
START TIME: 246991.999
STOP TIME: 247104.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 5.7
MAXIMUM VDOP: 5.9
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

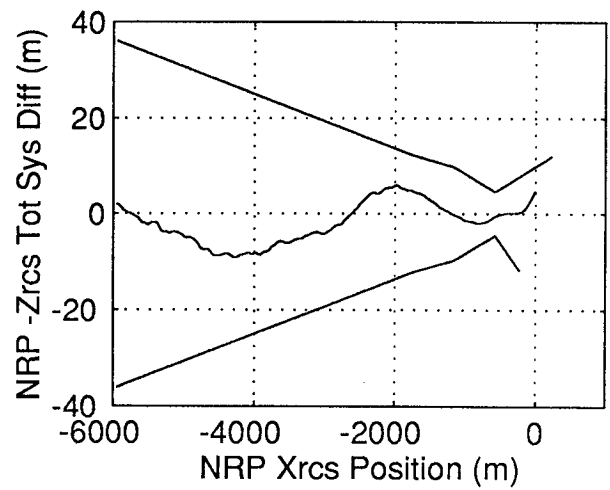
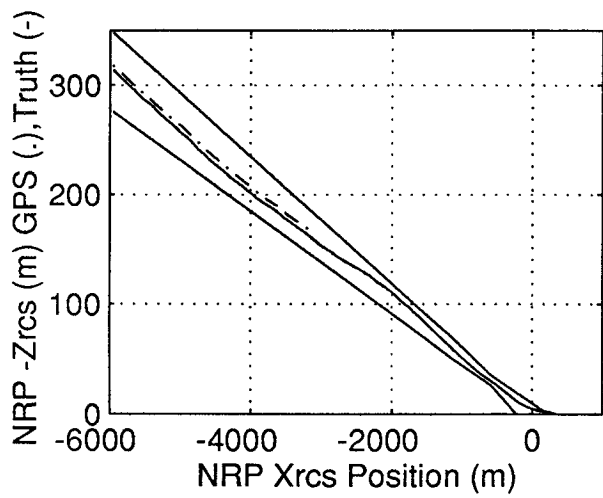
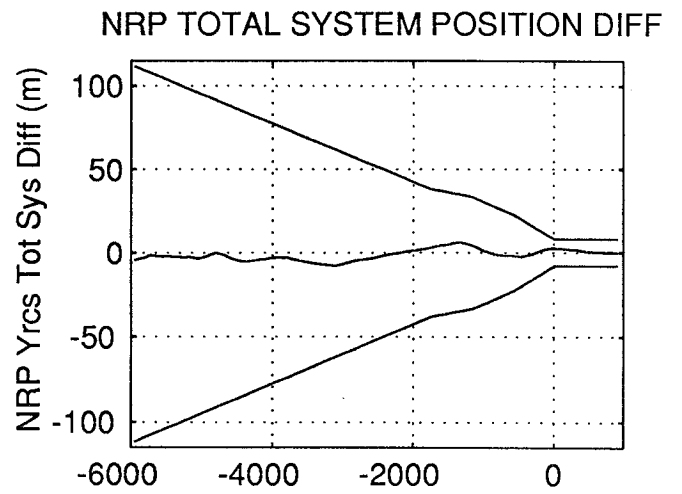
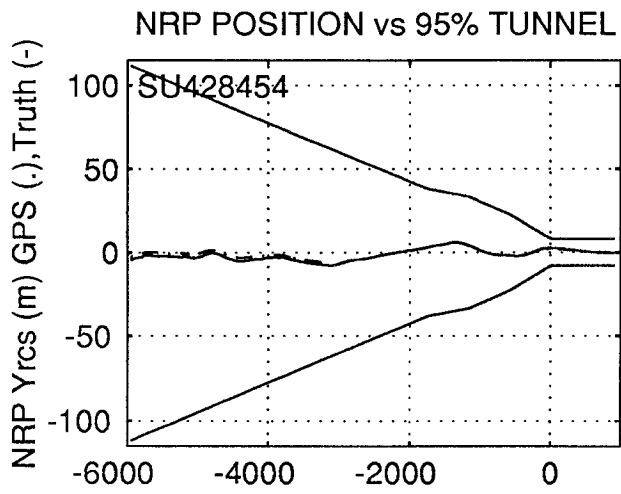
NRP Xrcs MEAN DIFFERENCE (m): 0.385
NRP Yrcs MEAN DIFFERENCE (m): -0.234
NRP Zrcs MEAN DIFFERENCE (m): 0.067

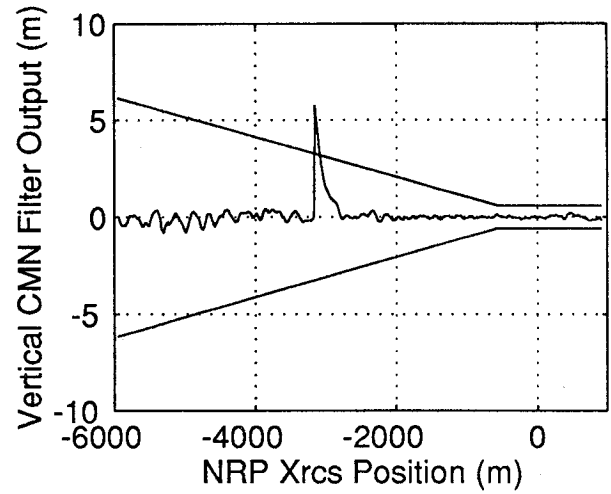
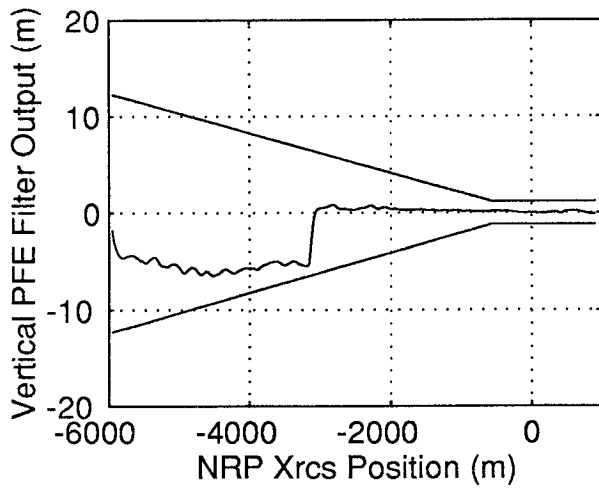
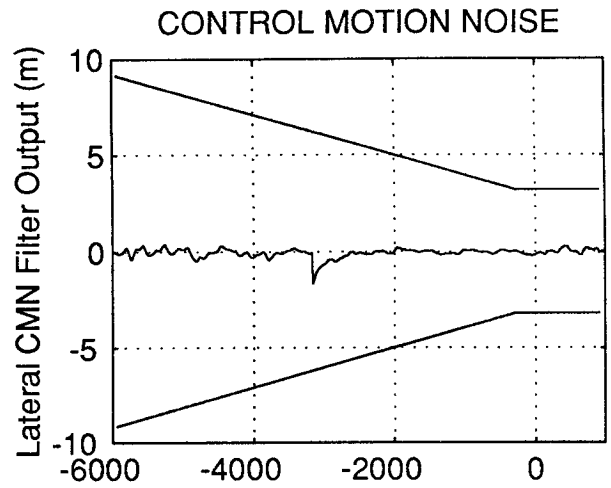
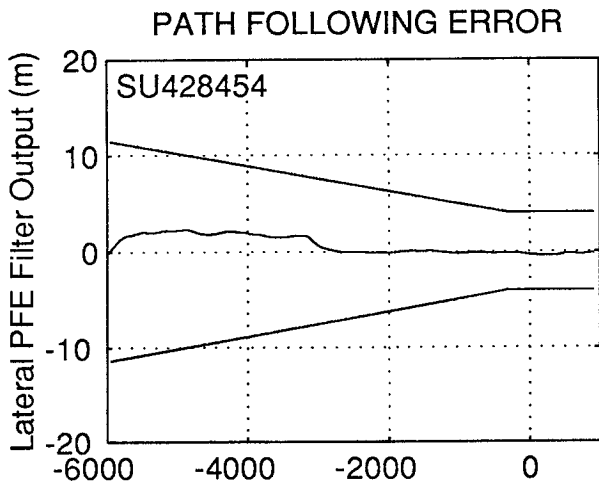
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.245
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.289
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.248

NRP Xrcs 2-RMS DIFFERENCE (m): 0.807
NRP Yrcs 2-RMS DIFFERENCE (m): 0.550
NRP Zrcs 2-RMS DIFFERENCE (m): 0.281

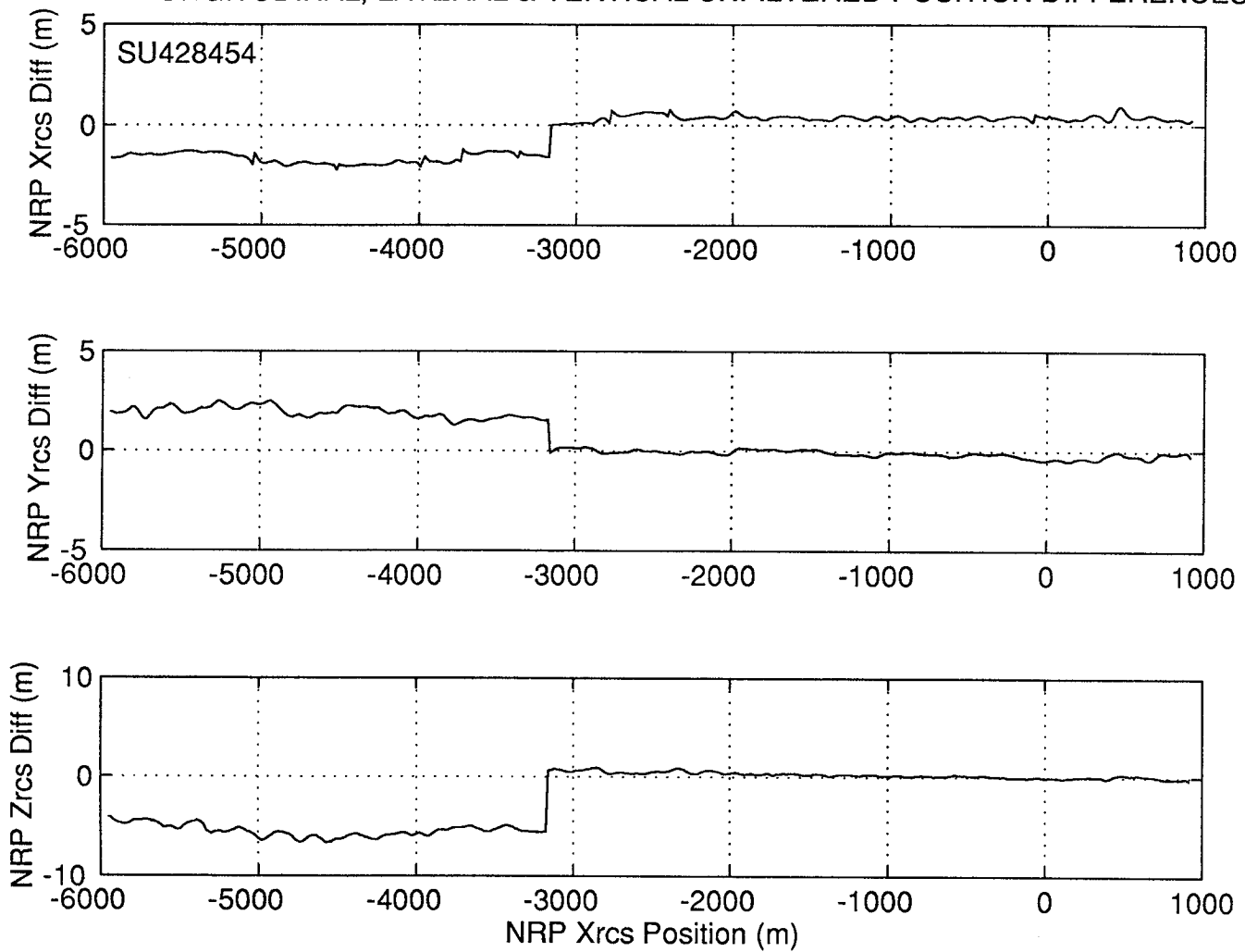
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 81.102
LGRP Yrcs POSITION (m): 2.946





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428456
START TIME: 247426.749
STOP TIME: 247542.249

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.7
MAXIMUM VDOP: 5.0
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.462
NRP Yrcs MEAN DIFFERENCE (m): -0.135
NRP Zrcs MEAN DIFFERENCE (m): 0.003

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.370
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.215
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.272

NRP Xrcs 2-RMS DIFFERENCE (m): 0.995
NRP Yrcs 2-RMS DIFFERENCE (m): 0.345
NRP Zrcs 2-RMS DIFFERENCE (m): 0.272

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 170.414
LGRP Yrcs POSITION (m): 1.619

APPROACH #: SU428456
START TIME: 247426.749
STOP TIME: 247542.249

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.7
MAXIMUM VDOP: 5.0
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

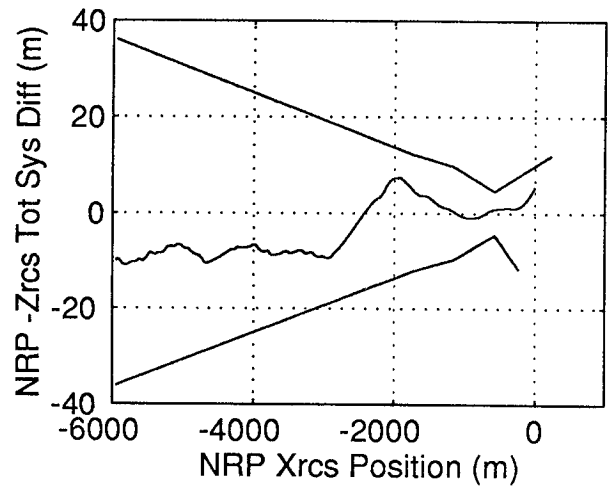
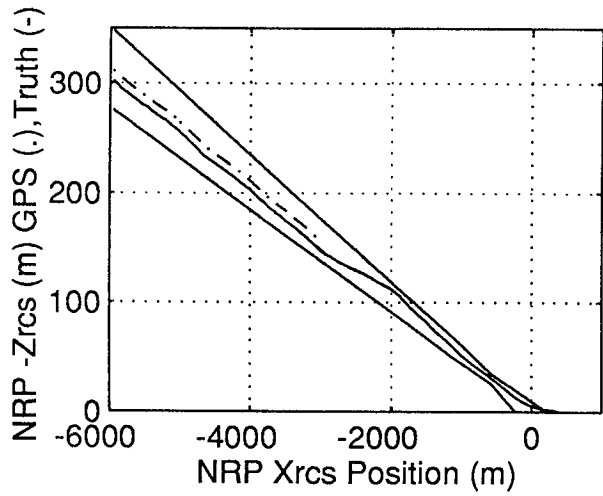
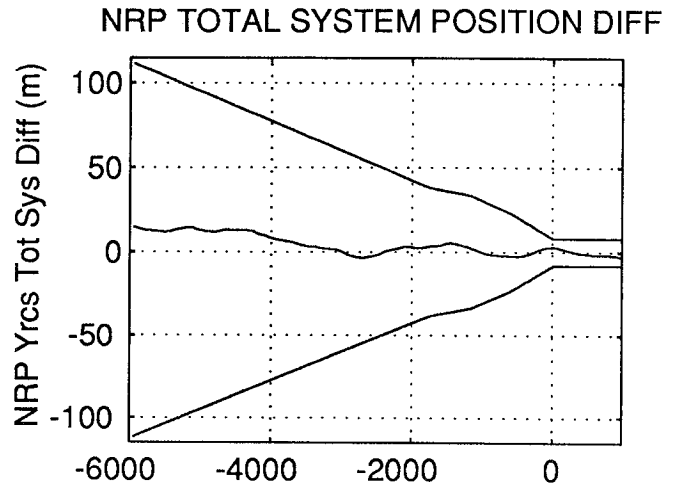
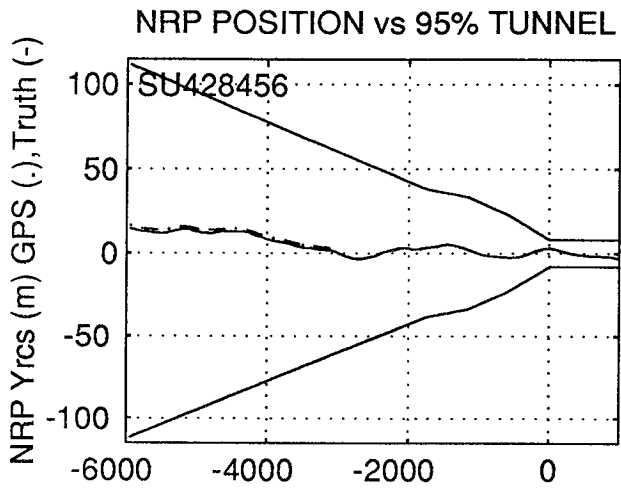
NRP Xrcs MEAN DIFFERENCE (m): 0.462
NRP Yrcs MEAN DIFFERENCE (m): -0.135
NRP Zrcs MEAN DIFFERENCE (m): 0.003

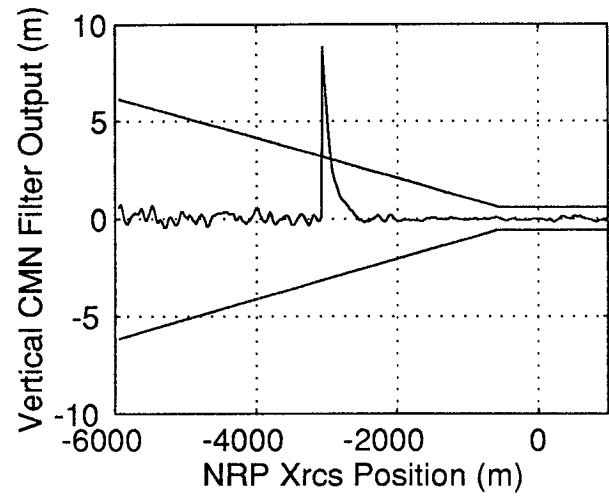
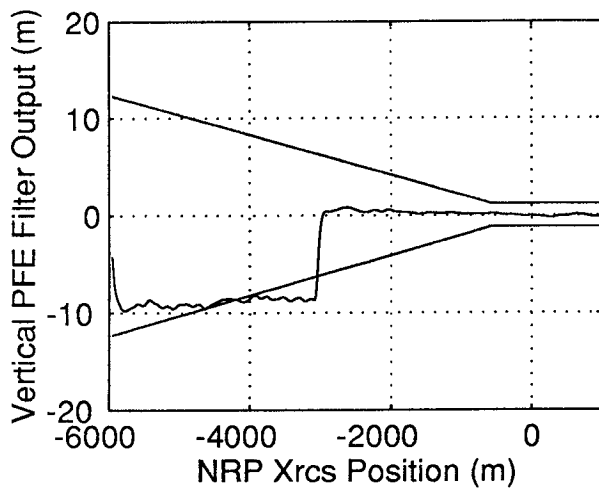
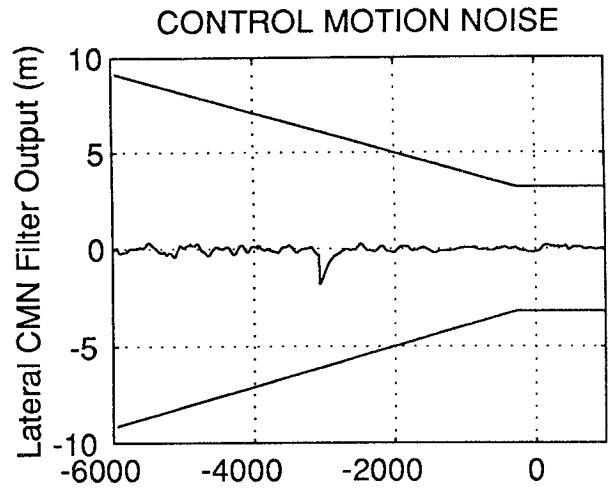
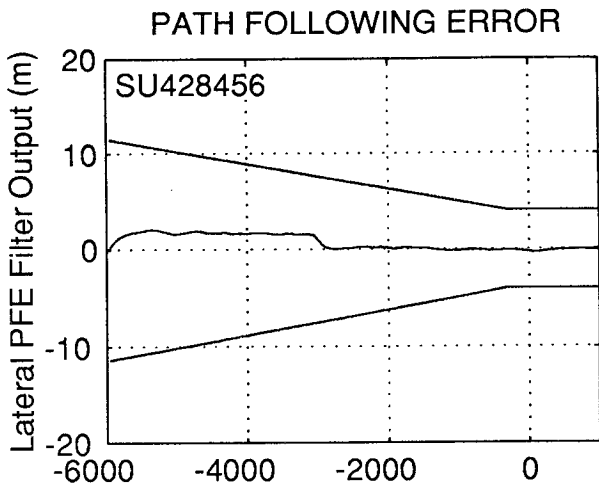
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.370
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.215
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.272

NRP Xrcs 2-RMS DIFFERENCE (m): 0.995
NRP Yrcs 2-RMS DIFFERENCE (m): 0.345
NRP Zrcs 2-RMS DIFFERENCE (m): 0.272

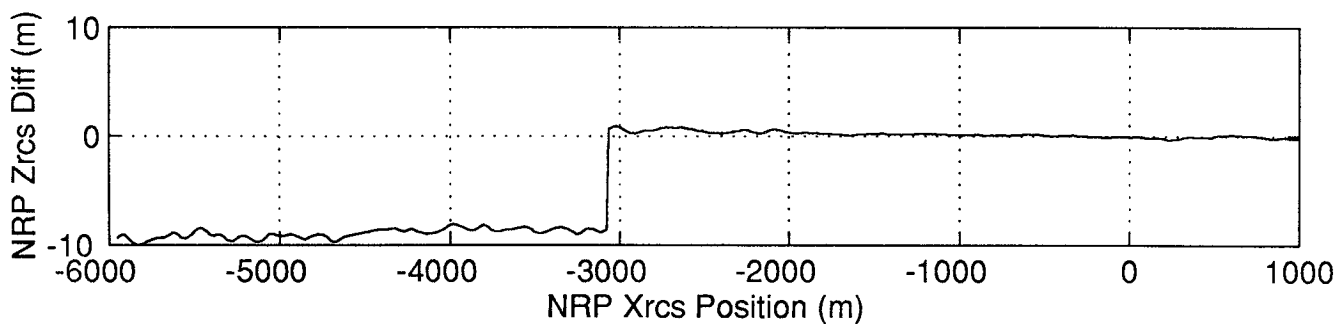
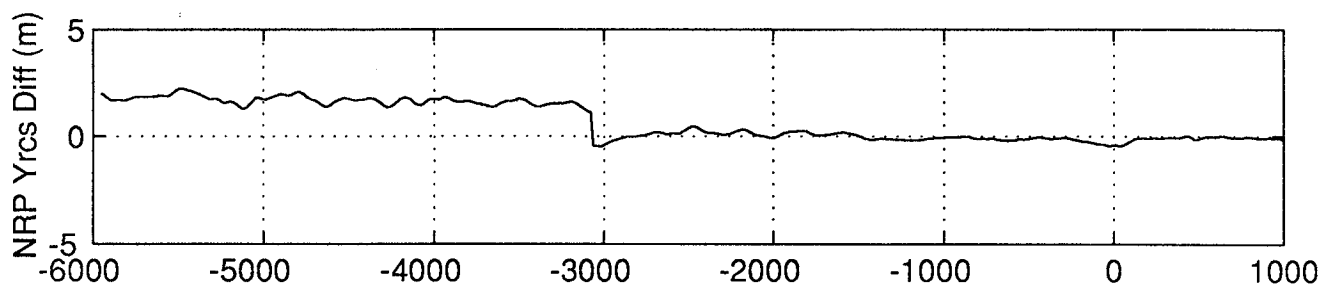
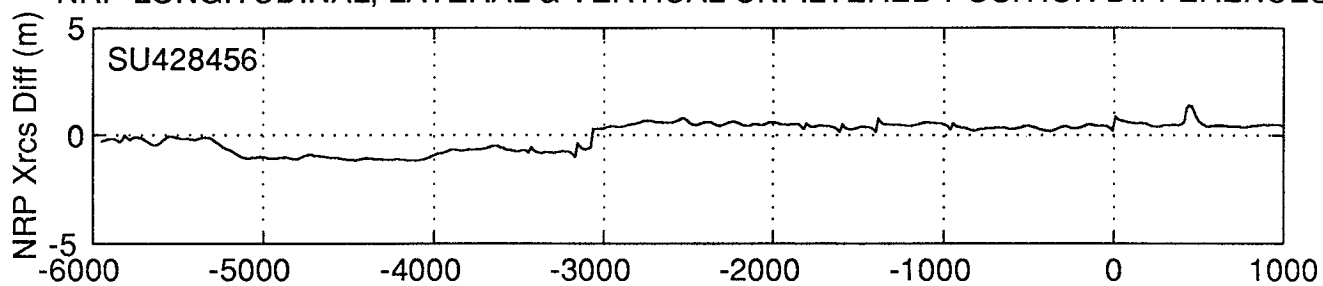
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 170.414
LGRP Yrcs POSITION (m): 1.619





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428458
START TIME: 247845.999
STOP TIME: 247959.749

MINIMUM HDOP: 1.9
MAXIMUM HDOP: 2.0
AVERAGE HDOP: 1.9

MINIMUM VDOP: 3.6
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.513
NRP Yrcs MEAN DIFFERENCE (m): -0.123
NRP Zrcs MEAN DIFFERENCE (m): 0.056

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.337
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.151
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.288

NRP Xrcs 2-RMS DIFFERENCE (m): 1.079
NRP Yrcs 2-RMS DIFFERENCE (m): 0.289
NRP Zrcs 2-RMS DIFFERENCE (m): 0.309

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 194.833
LGRP Yrcs POSITION (m): 1.500

APPROACH #: SU428458
START TIME: 247845.999
STOP TIME: 247959.749

MINIMUM HDOP: 1.9
MAXIMUM HDOP: 2.0
AVERAGE HDOP: 1.9

MINIMUM VDOP: 3.6
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

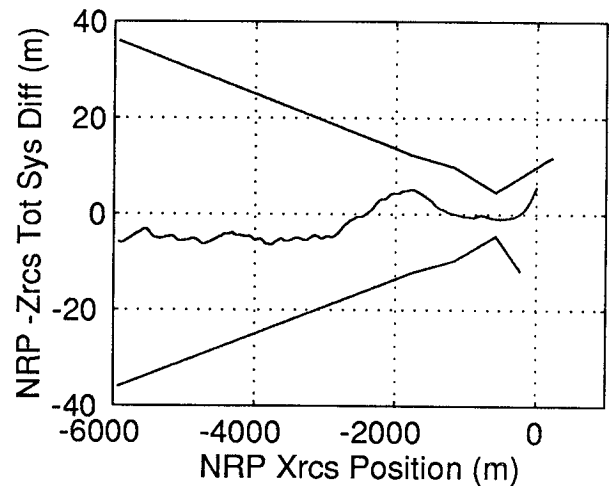
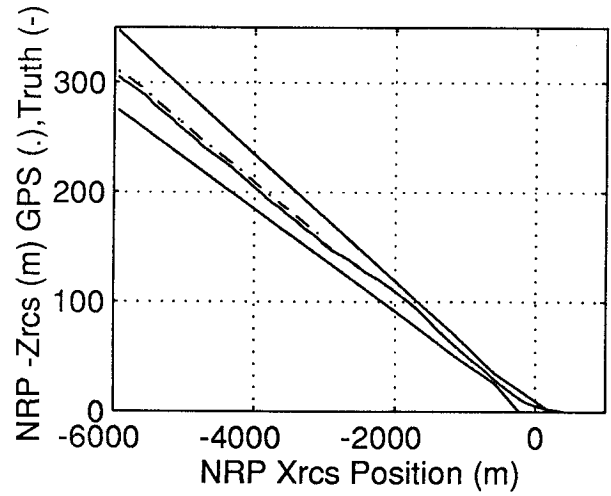
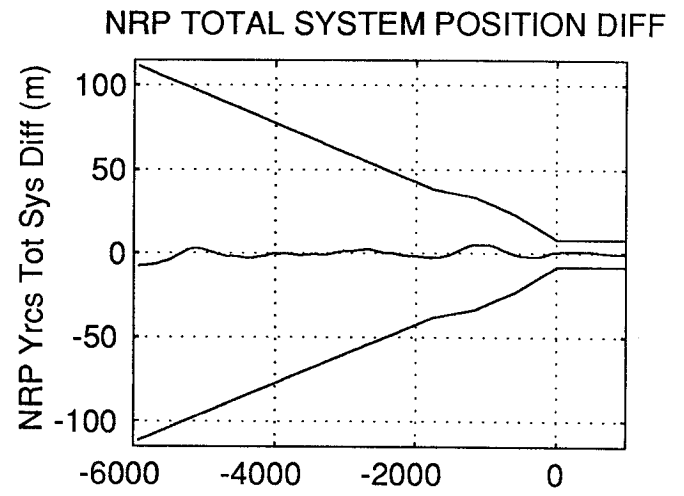
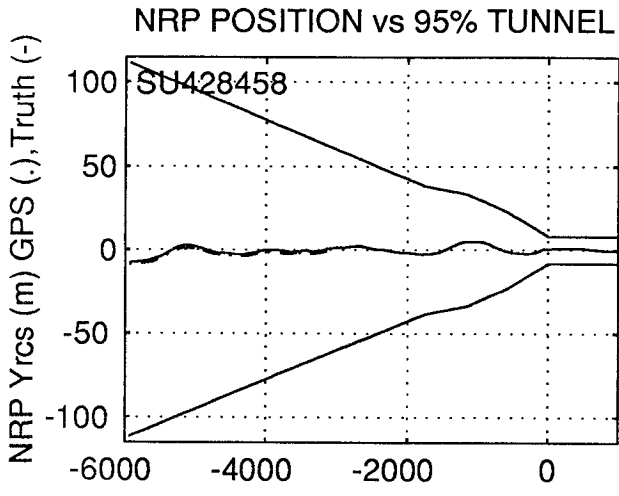
NRP Xrcs MEAN DIFFERENCE (m): 0.513
NRP Yrcs MEAN DIFFERENCE (m): -0.123
NRP Zrcs MEAN DIFFERENCE (m): 0.056

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.337
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.151
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.288

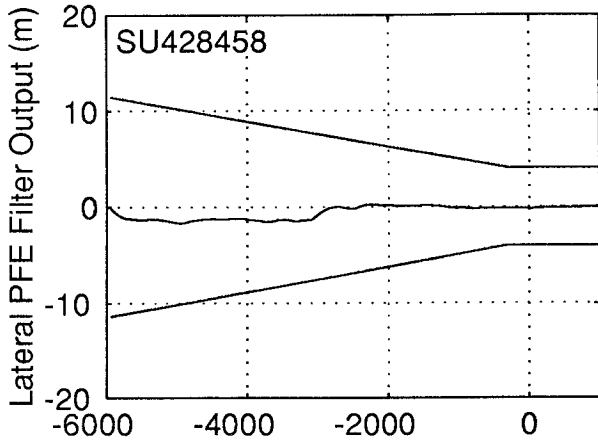
NRP Xrcs 2-RMS DIFFERENCE (m): 1.079
NRP Yrcs 2-RMS DIFFERENCE (m): 0.289
NRP Zrcs 2-RMS DIFFERENCE (m): 0.309

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

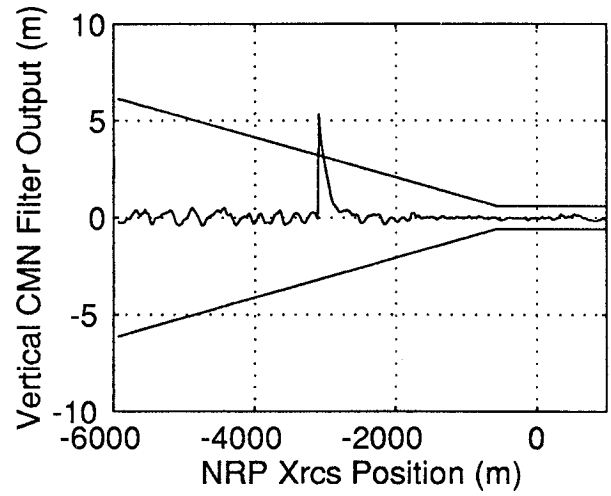
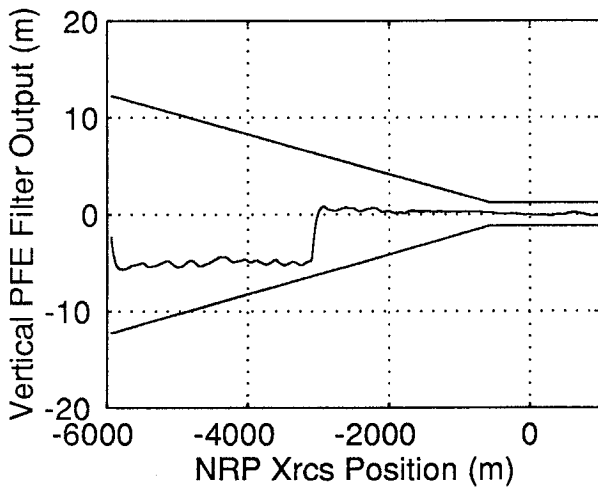
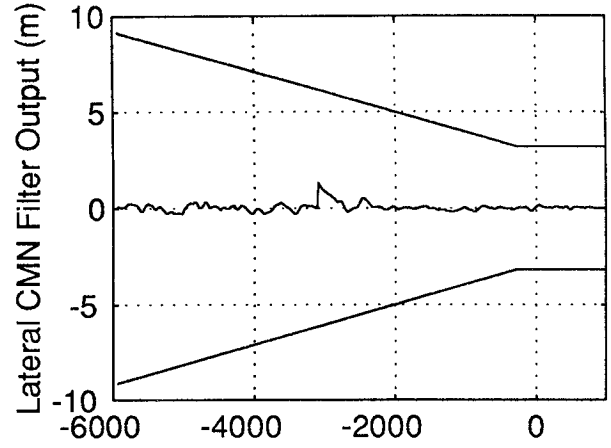
LGRP Xrcs POSITION (m): 194.833
LGRP Yrcs POSITION (m): 1.500



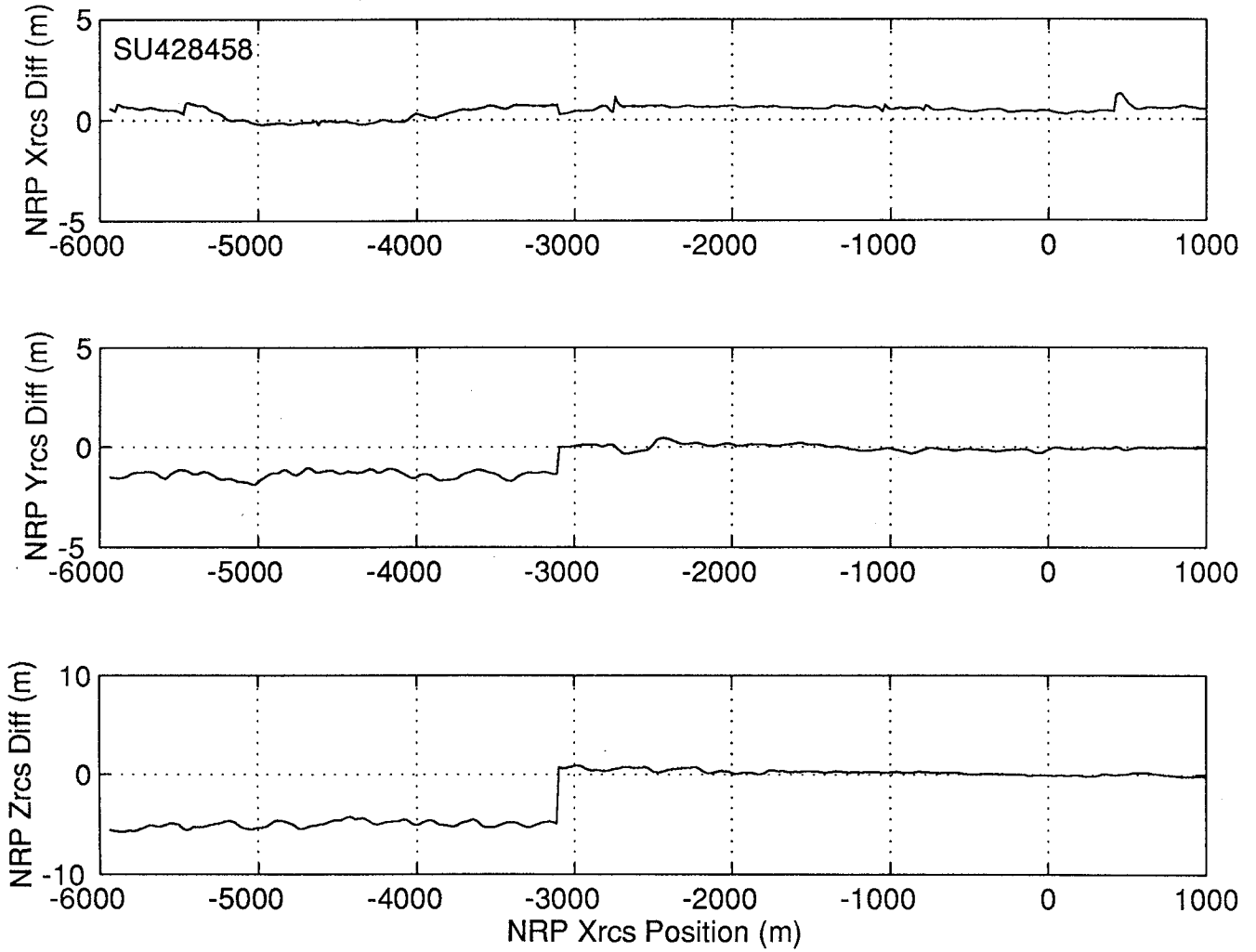
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428460
START TIME: 248254.249
STOP TIME: 248370.249

MINIMUM HDOP: 2.1
MAXIMUM HDOP: 2.1
AVERAGE HDOP: 2.1

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.516
NRP Yrcs MEAN DIFFERENCE (m): 0.022
NRP Zrcs MEAN DIFFERENCE (m): 0.008

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.179
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.129
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.282

NRP Xrcs 2-RMS DIFFERENCE (m): 1.047
NRP Yrcs 2-RMS DIFFERENCE (m): 0.137
NRP Zrcs 2-RMS DIFFERENCE (m): 0.282

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 256.232
LGRP Yrcs POSITION (m): 0.259

APPROACH #: SU428460
START TIME: 248254.249
STOP TIME: 248370.249

MINIMUM HDOP: 2.1
MAXIMUM HDOP: 2.1
AVERAGE HDOP: 2.1

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

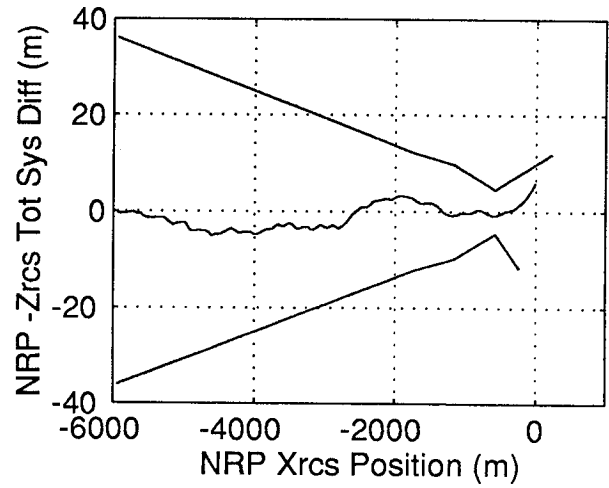
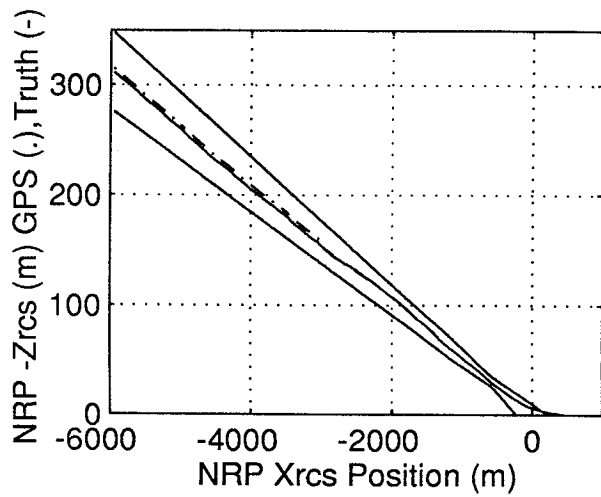
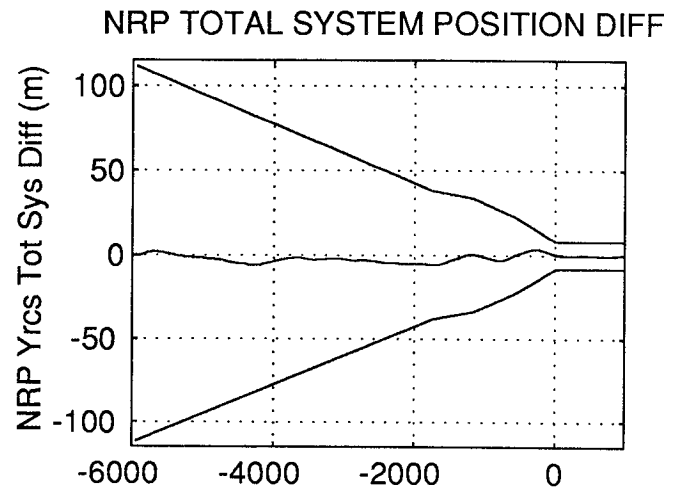
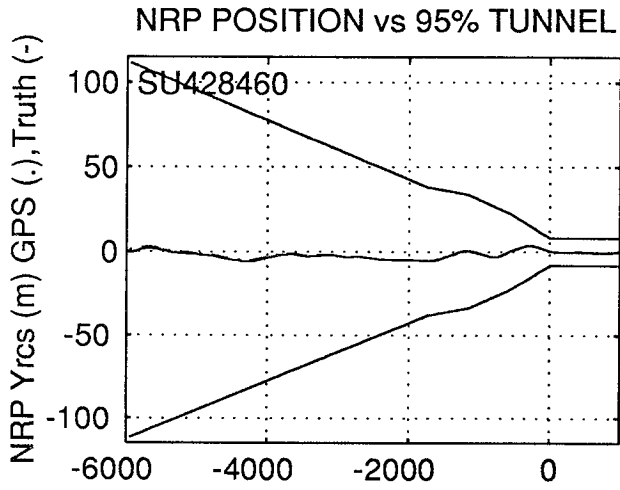
NRP Xrcs MEAN DIFFERENCE (m): 0.516
NRP Yrcs MEAN DIFFERENCE (m): 0.022
NRP Zrcs MEAN DIFFERENCE (m): 0.008

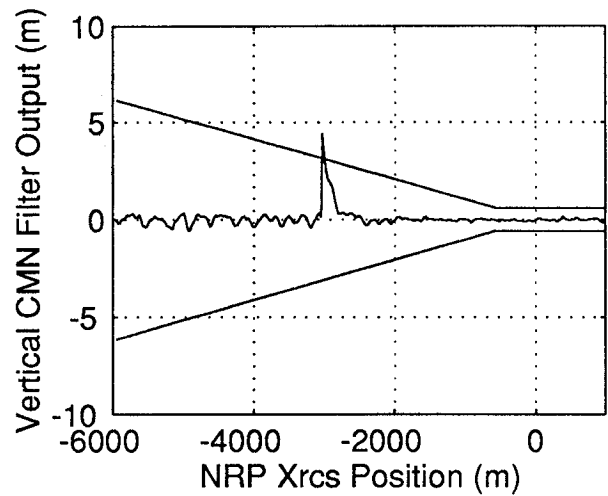
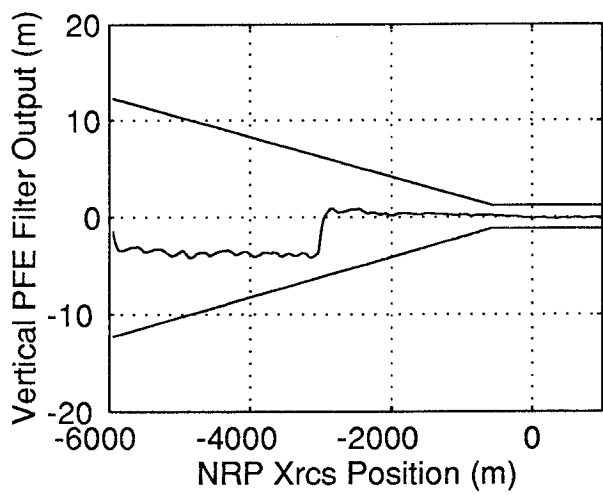
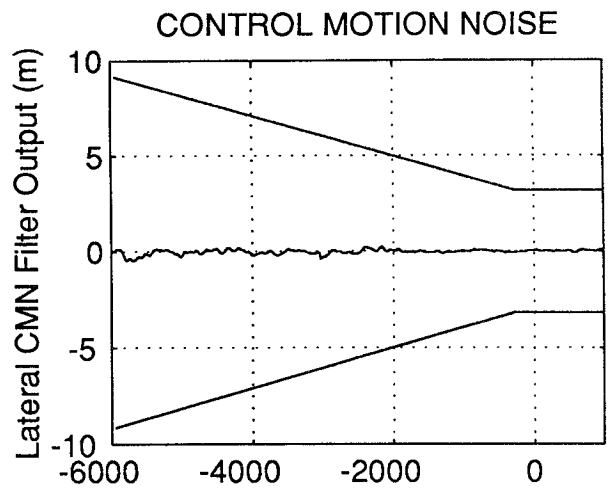
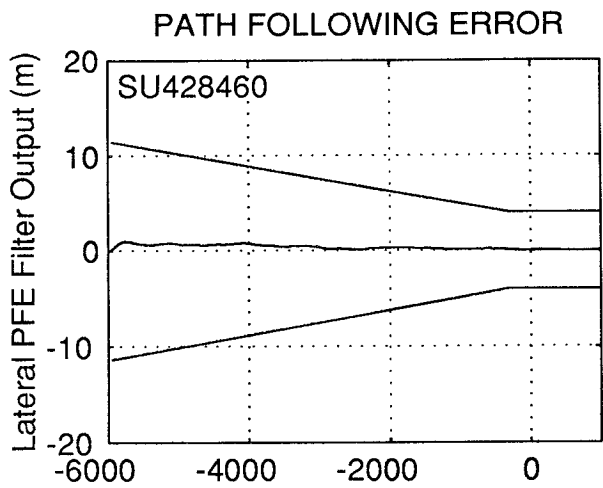
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.179
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.129
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.282

NRP Xrcs 2-RMS DIFFERENCE (m): 1.047
NRP Yrcs 2-RMS DIFFERENCE (m): 0.137
NRP Zrcs 2-RMS DIFFERENCE (m): 0.282

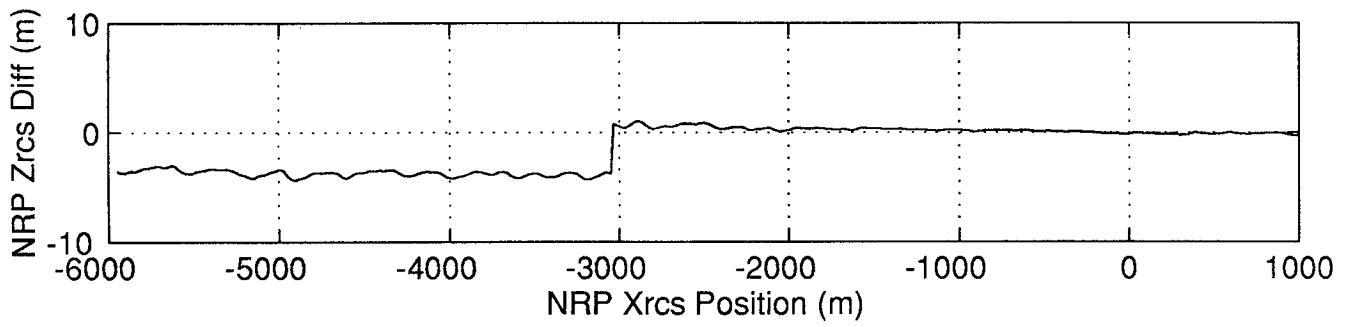
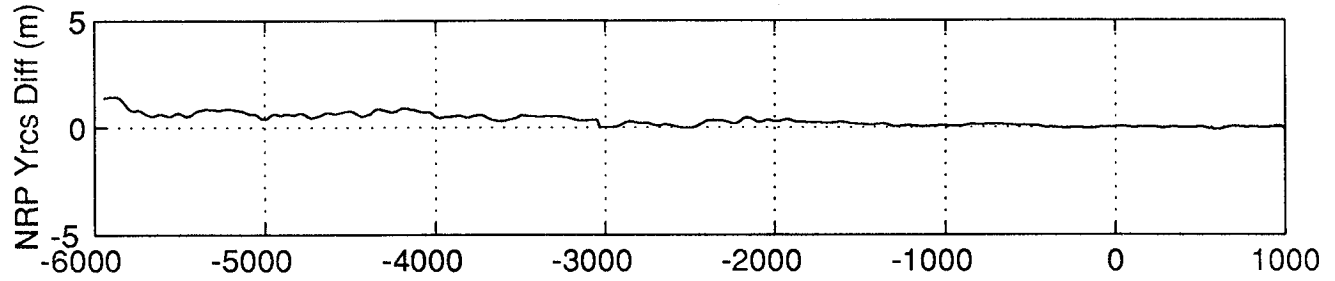
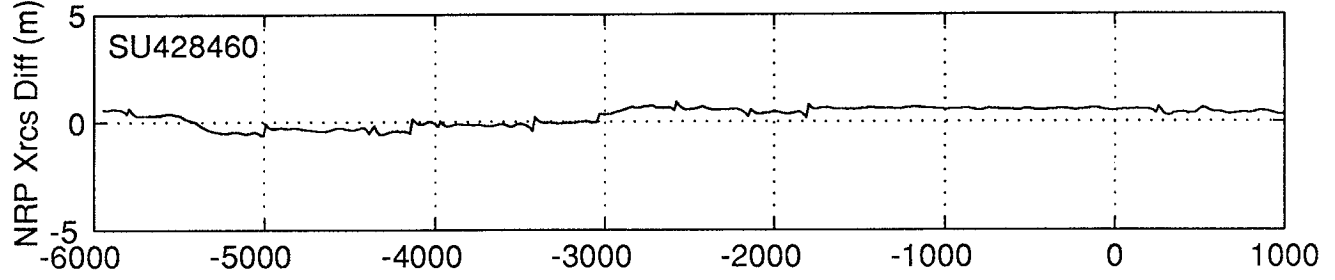
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 256.232
LGRP Yrcs POSITION (m): 0.259





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428462
START TIME: 248668.249
STOP TIME: 248781.999

MINIMUM HDOP: 5.5
MAXIMUM HDOP: 6.4
AVERAGE HDOP: 5.9

MINIMUM VDOP: 13.2
MAXIMUM VDOP: 15.9
AVERAGE VDOP: 14.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.617
NRP Yrcs MEAN DIFFERENCE (m): -0.334
NRP Zrcs MEAN DIFFERENCE (m): 0.031

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.403
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.571
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.277

NRP Xrcs 2-RMS DIFFERENCE (m): 1.298
NRP Yrcs 2-RMS DIFFERENCE (m): 0.879
NRP Zrcs 2-RMS DIFFERENCE (m): 0.284

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 190.189
LGRP Yrcs POSITION (m): 3.431

APPROACH #: SU428462
START TIME: 248668.249
STOP TIME: 248781.999

MINIMUM HDOP: 5.5
MAXIMUM HDOP: 6.4
AVERAGE HDOP: 5.9

MINIMUM VDOP: 13.2
MAXIMUM VDOP: 15.9
AVERAGE VDOP: 14.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

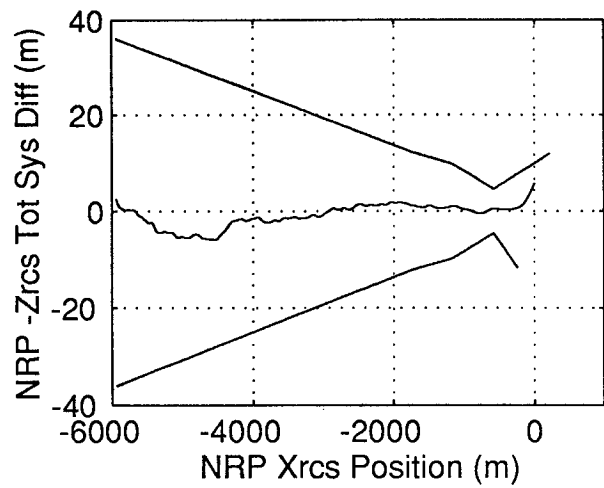
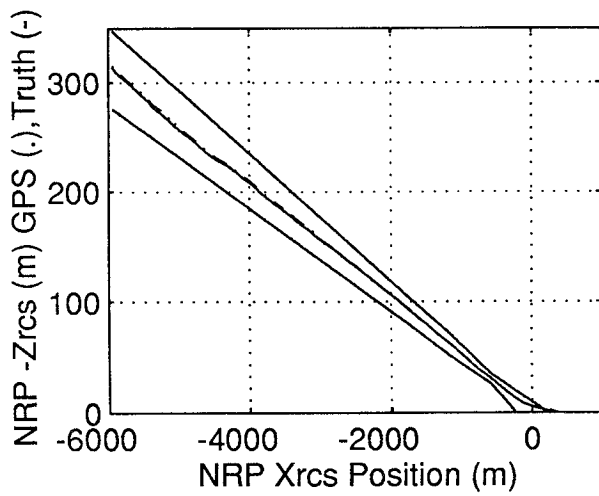
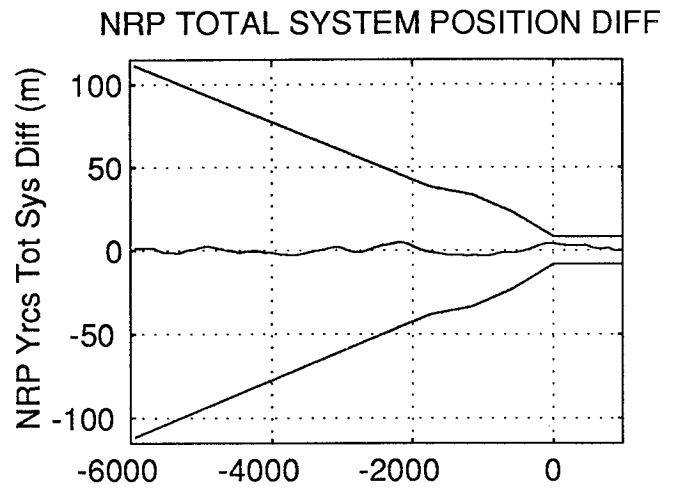
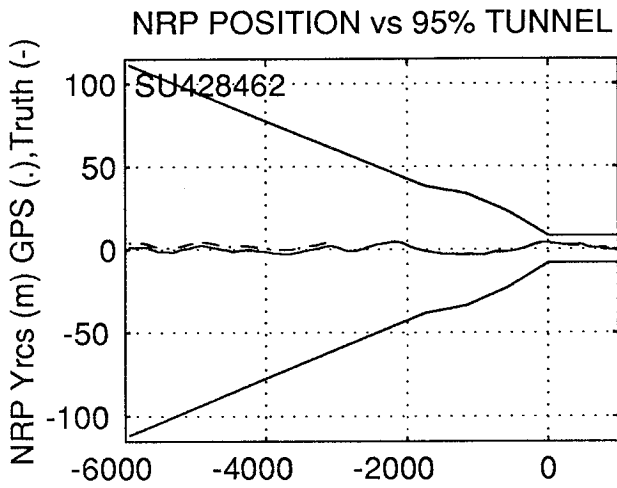
NRP Xrcs MEAN DIFFERENCE (m): 0.617
NRP Yrcs MEAN DIFFERENCE (m): -0.334
NRP Zrcs MEAN DIFFERENCE (m): 0.031

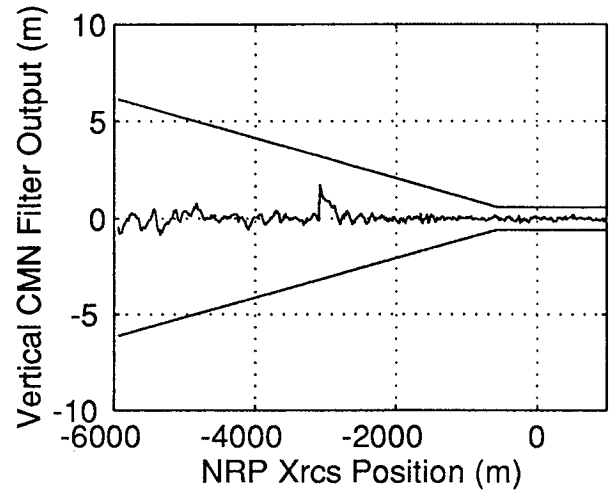
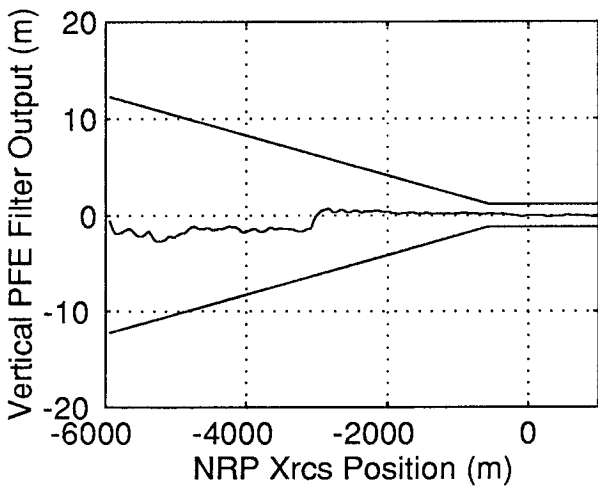
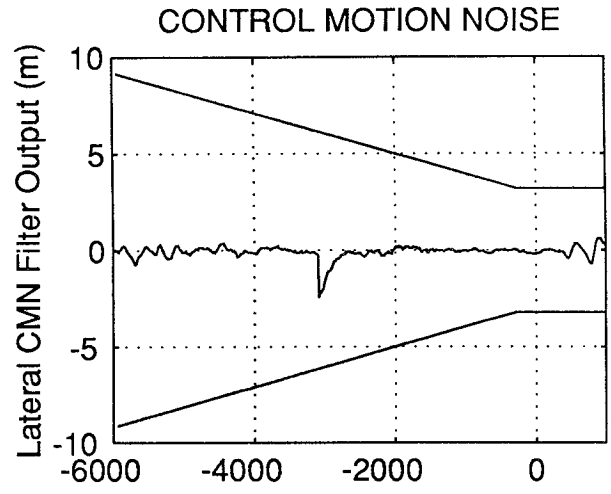
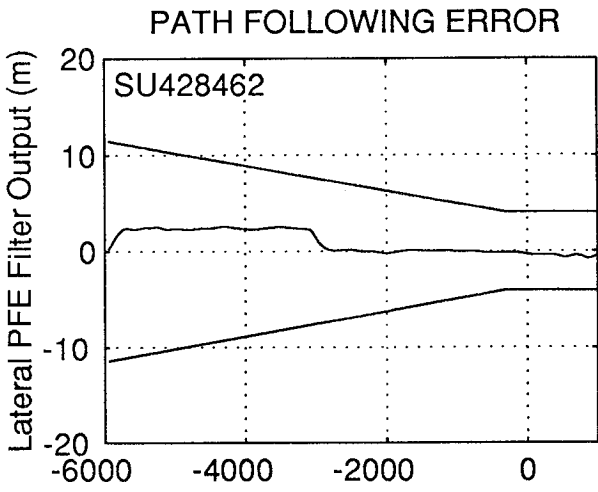
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.403
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.571
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.277

NRP Xrcs 2-RMS DIFFERENCE (m): 1.298
NRP Yrcs 2-RMS DIFFERENCE (m): 0.879
NRP Zrcs 2-RMS DIFFERENCE (m): 0.284

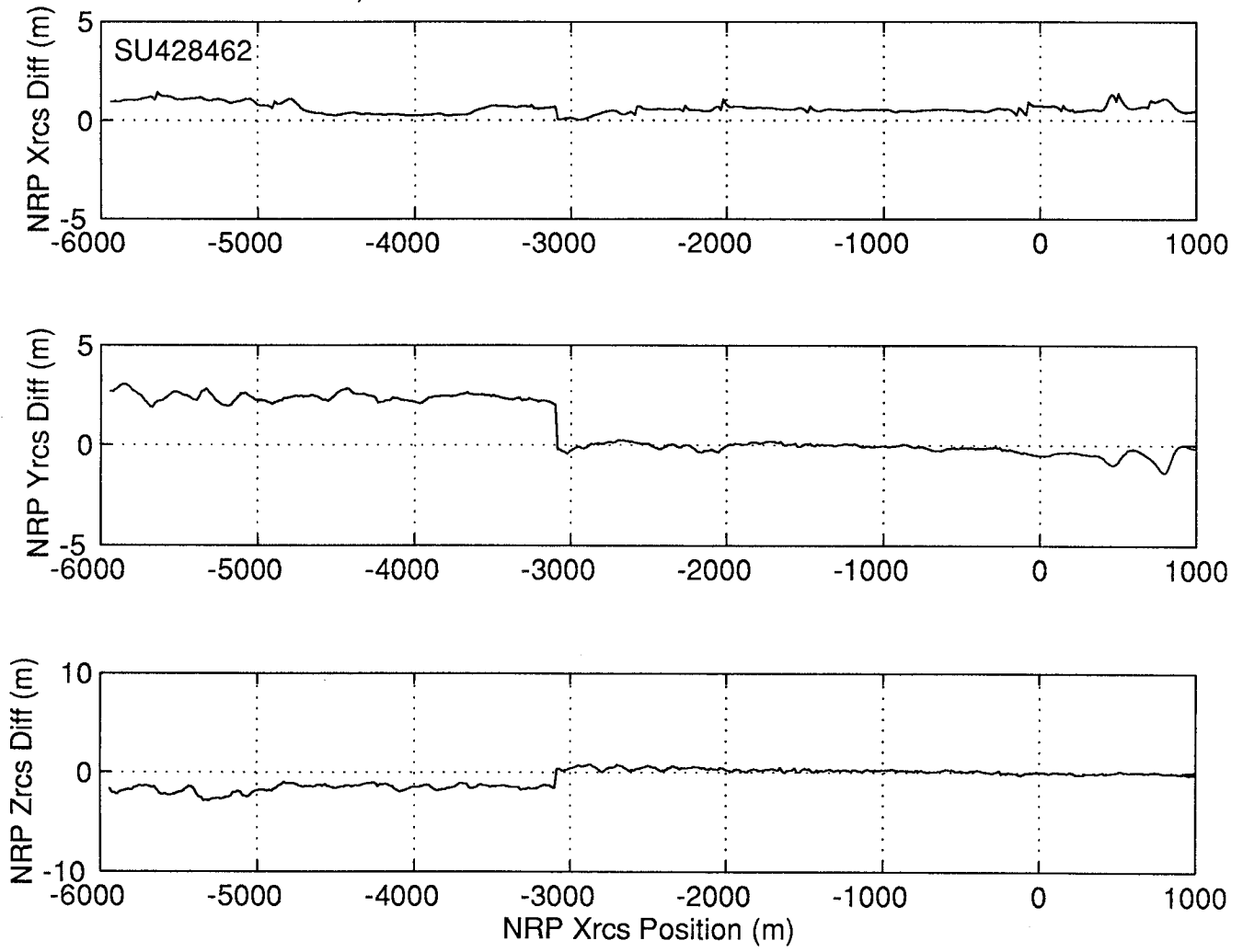
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 190.189
LGRP Yrcs POSITION (m): 3.431





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428464
START TIME: 249107.749
STOP TIME: 249227.499

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.0
MAXIMUM VDOP: 8.9
AVERAGE VDOP: 8.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.422
NRP Yrcs MEAN DIFFERENCE (m): -0.232
NRP Zrcs MEAN DIFFERENCE (m): 0.087

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.215
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.363
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.228

NRP Xrcs 2-RMS DIFFERENCE (m): 0.870
NRP Yrcs 2-RMS DIFFERENCE (m): 0.590
NRP Zrcs 2-RMS DIFFERENCE (m): 0.286

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 318.170
LGRP Yrcs POSITION (m): 0.668

APPROACH #: SU428464
START TIME: 249107.749
STOP TIME: 249227.499

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.0
MAXIMUM VDOP: 8.9
AVERAGE VDOP: 8.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

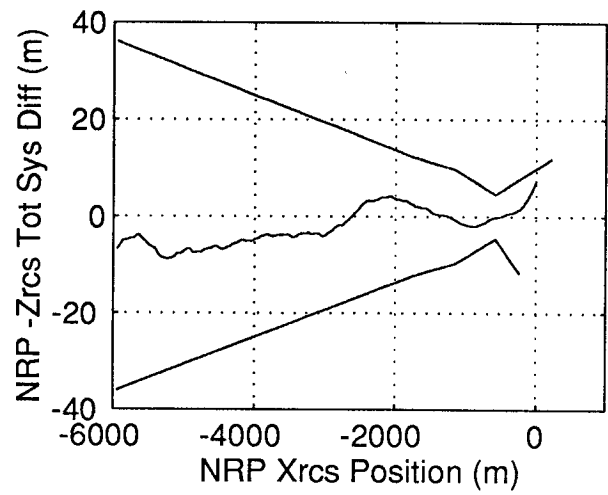
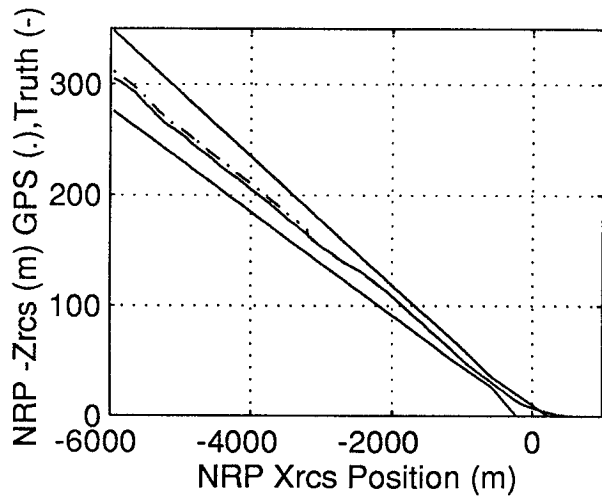
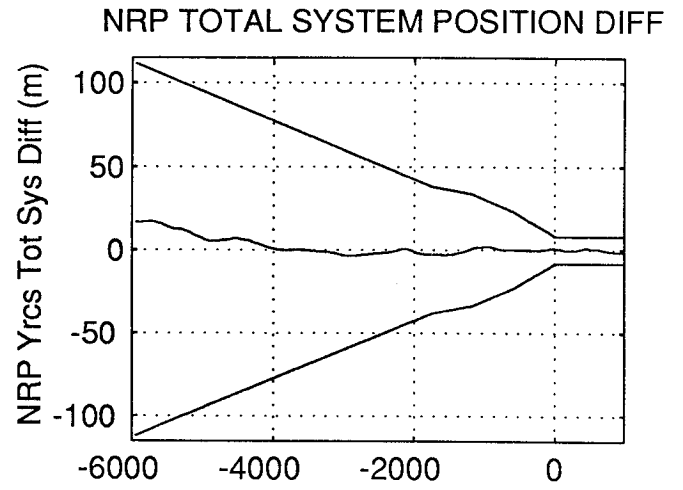
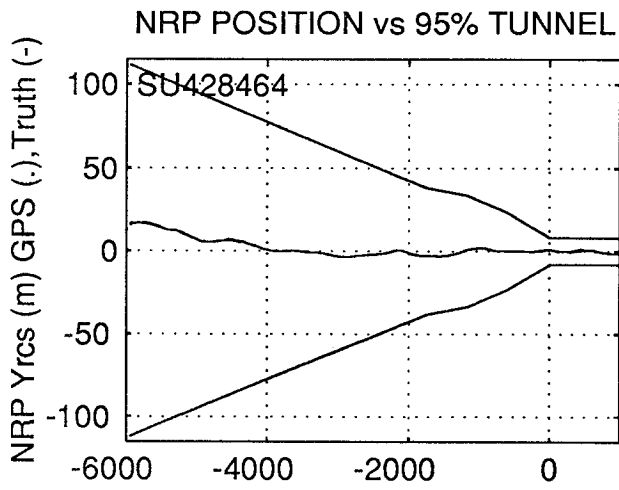
NRP Xrcs MEAN DIFFERENCE (m): 0.422
NRP Yrcs MEAN DIFFERENCE (m): -0.232
NRP Zrcs MEAN DIFFERENCE (m): 0.087

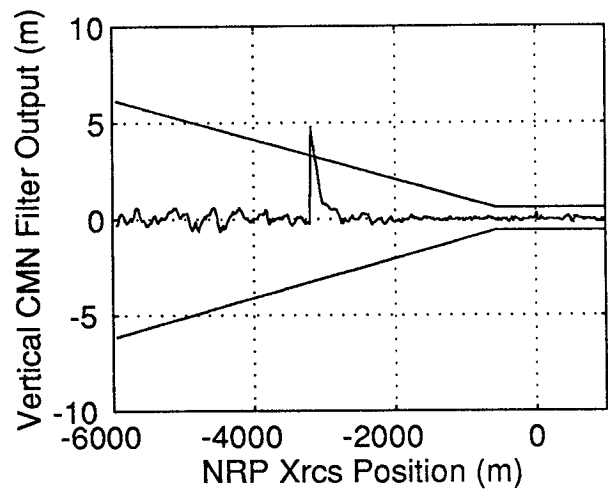
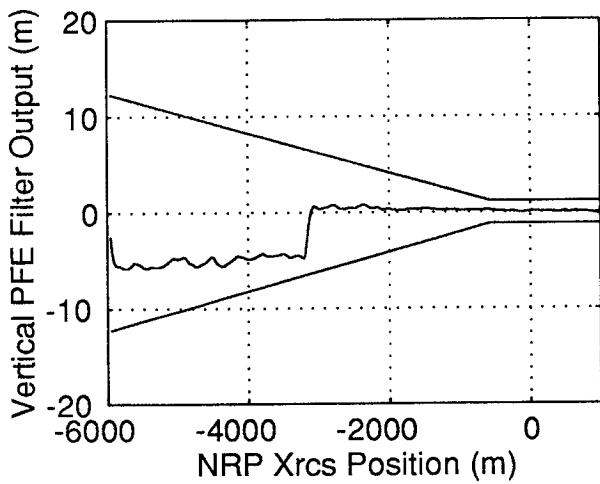
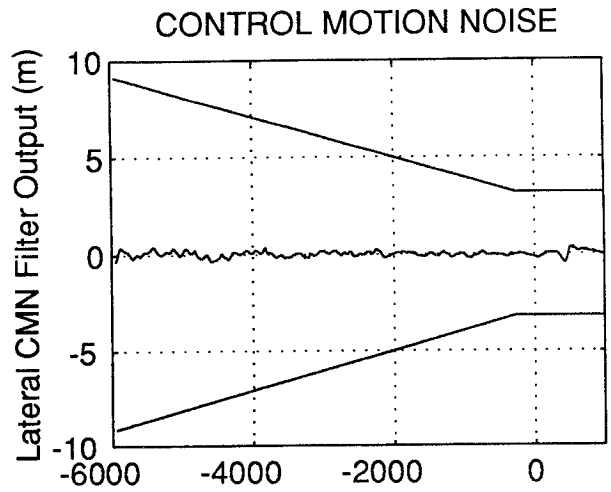
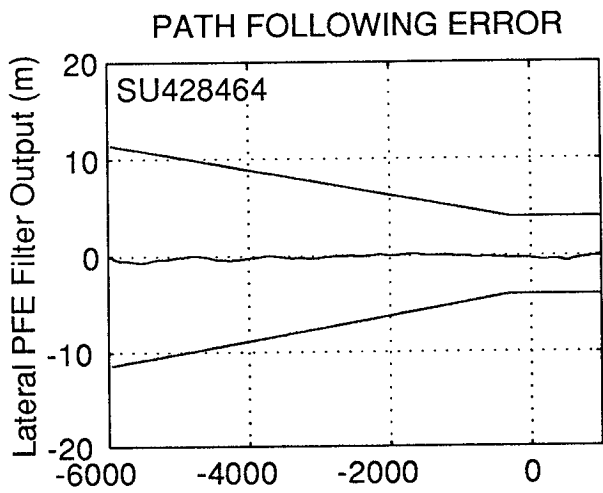
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.215
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.363
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.228

NRP Xrcs 2-RMS DIFFERENCE (m): 0.870
NRP Yrcs 2-RMS DIFFERENCE (m): 0.590
NRP Zrcs 2-RMS DIFFERENCE (m): 0.286

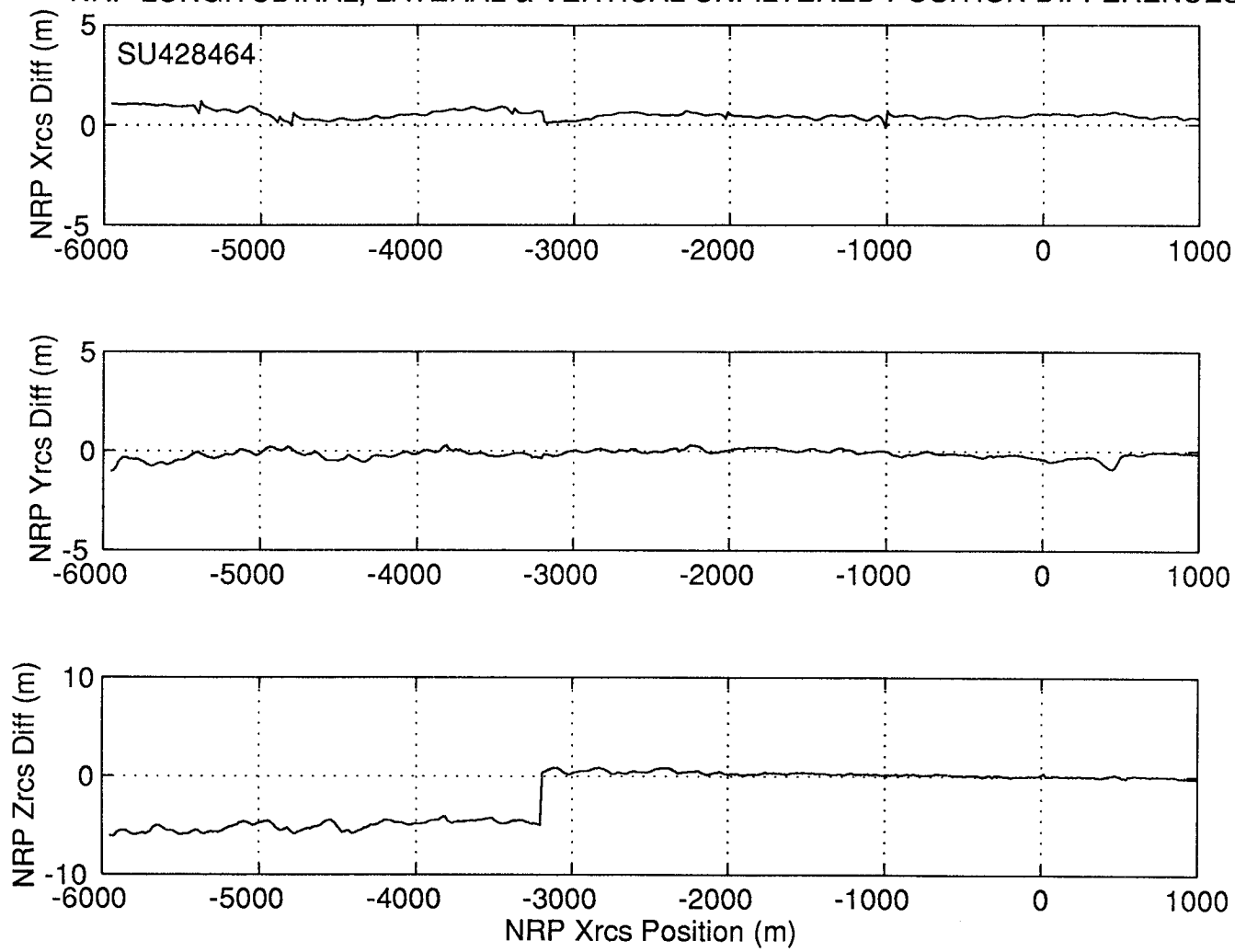
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 318.170
LGRP Yrcs POSITION (m): 0.668





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428466
START TIME: 249554.749
STOP TIME: 249673.749

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 6.3
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.483
NRP Yrcs MEAN DIFFERENCE (m): -0.111
NRP Zrcs MEAN DIFFERENCE (m): 0.099

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.176
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.144
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.259

NRP Xrcs 2-RMS DIFFERENCE (m): 0.981
NRP Yrcs 2-RMS DIFFERENCE (m): 0.264
NRP Zrcs 2-RMS DIFFERENCE (m): 0.326

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 290.855
LGRP Yrcs POSITION (m): 3.532

APPROACH #: SU428466
START TIME: 249554.749
STOP TIME: 249673.749

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 6.3
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

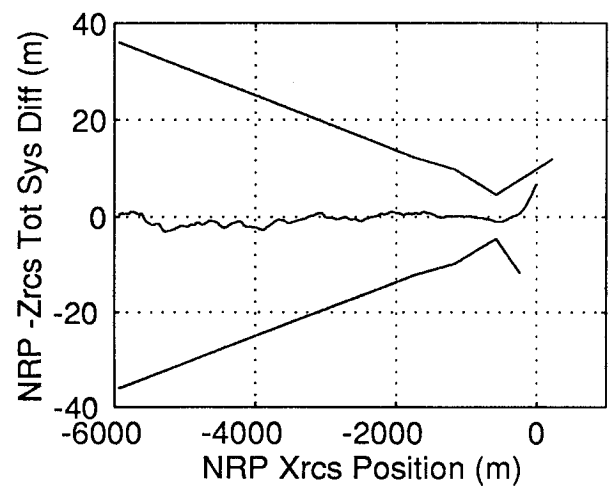
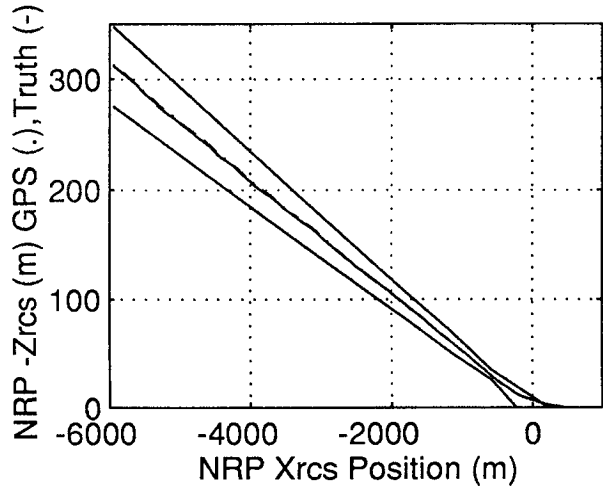
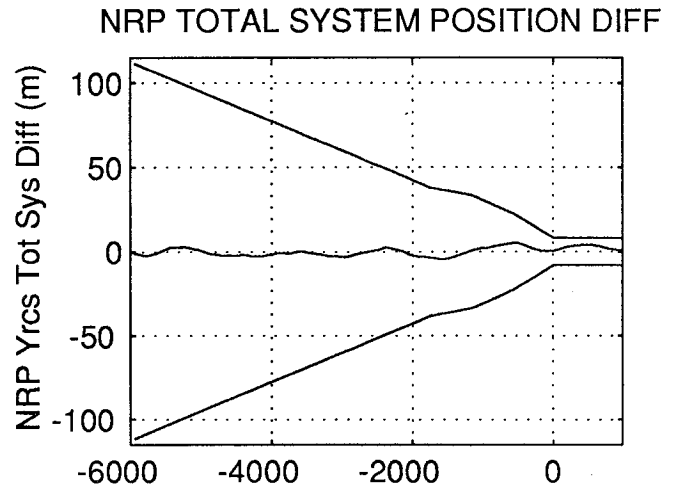
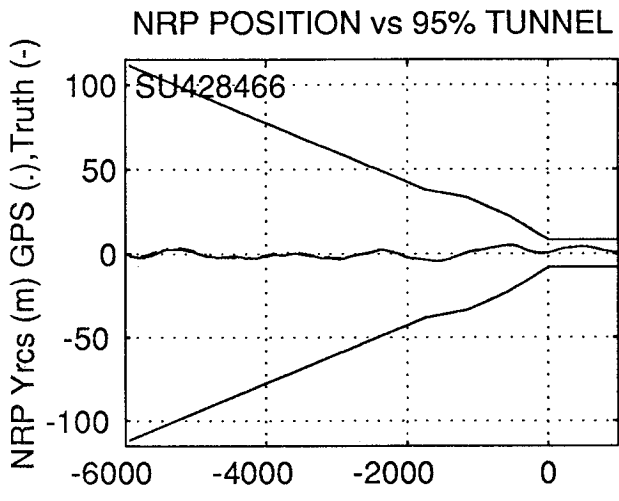
NRP Xrcs MEAN DIFFERENCE (m): 0.483
NRP Yrcs MEAN DIFFERENCE (m): -0.111
NRP Zrcs MEAN DIFFERENCE (m): 0.099

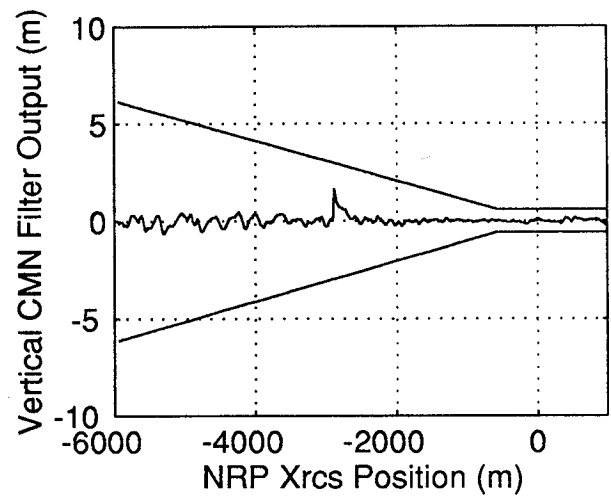
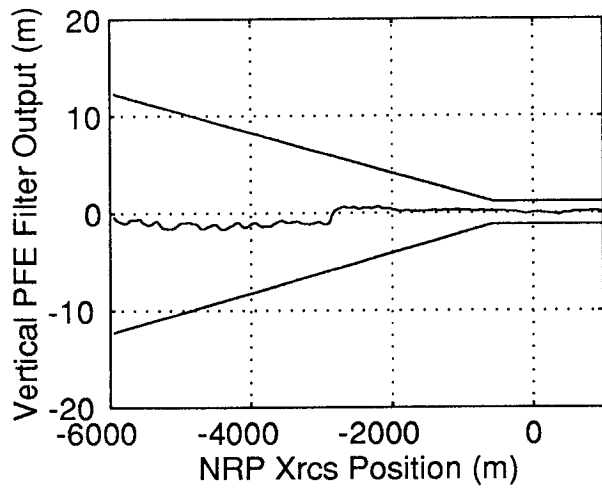
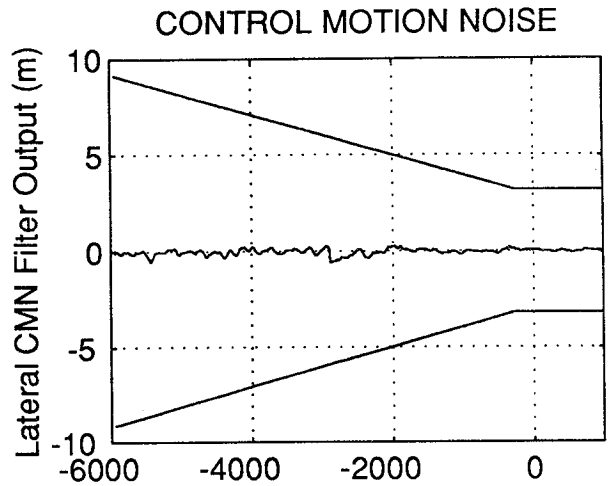
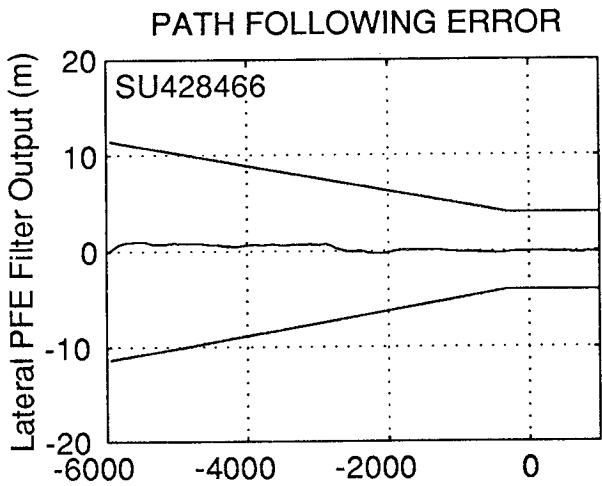
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.176
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.144
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.259

NRP Xrcs 2-RMS DIFFERENCE (m): 0.981
NRP Yrcs 2-RMS DIFFERENCE (m): 0.264
NRP Zrcs 2-RMS DIFFERENCE (m): 0.326

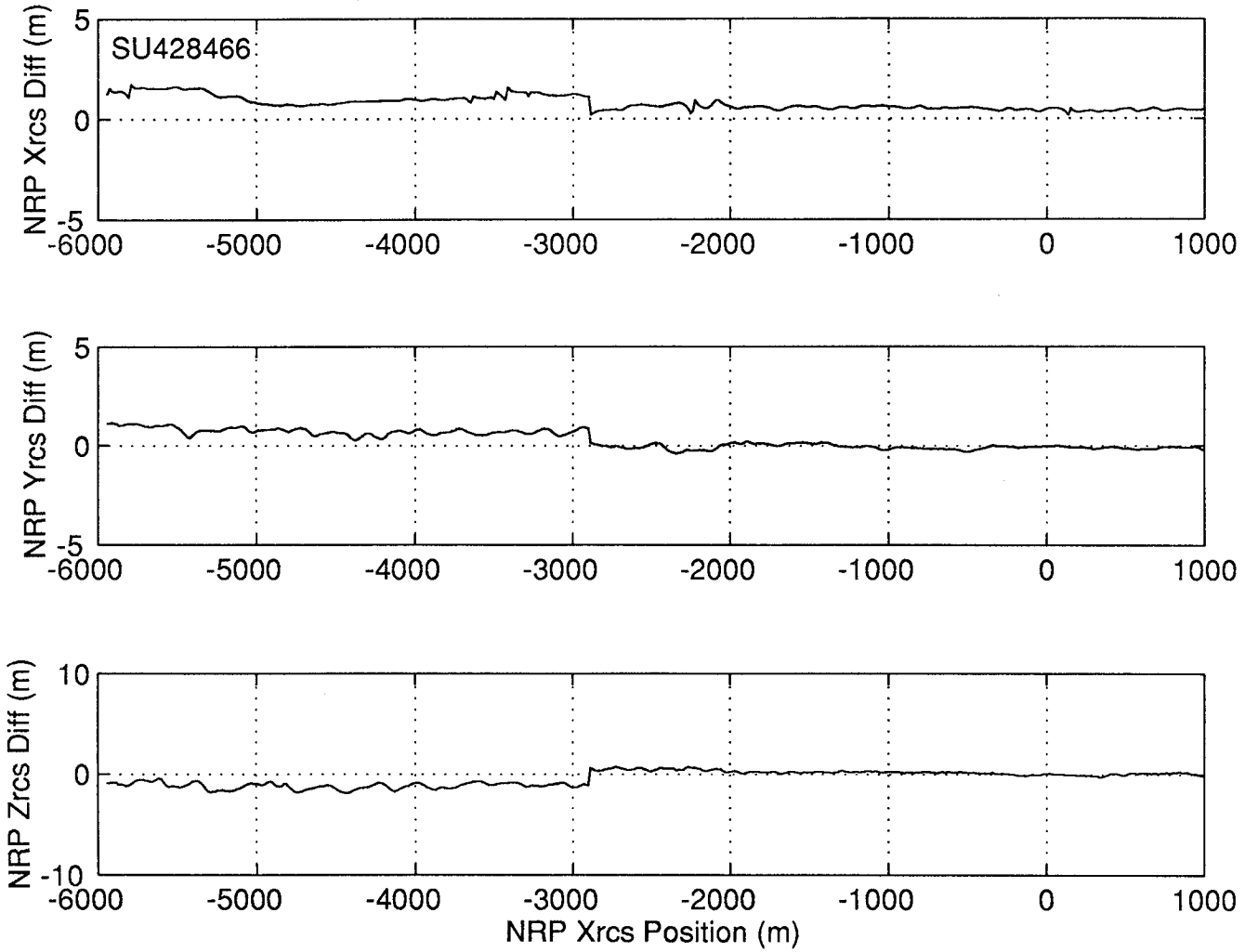
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 290.855
LGRP Yrcs POSITION (m): 3.532





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428468
START TIME: 249979.749
STOP TIME: 250099.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.9

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 5.0
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.514
NRP Yrcs MEAN DIFFERENCE (m): -0.212
NRP Zrcs MEAN DIFFERENCE (m): -0.004

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.247
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.405
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.312

NRP Xrcs 2-RMS DIFFERENCE (m): 1.058
NRP Yrcs 2-RMS DIFFERENCE (m): 0.587
NRP Zrcs 2-RMS DIFFERENCE (m): 0.312

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 161.687
LGRP Yrcs POSITION (m): -0.457

APPROACH #: SU428468
START TIME: 249979.749
STOP TIME: 250099.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.9

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 5.0
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

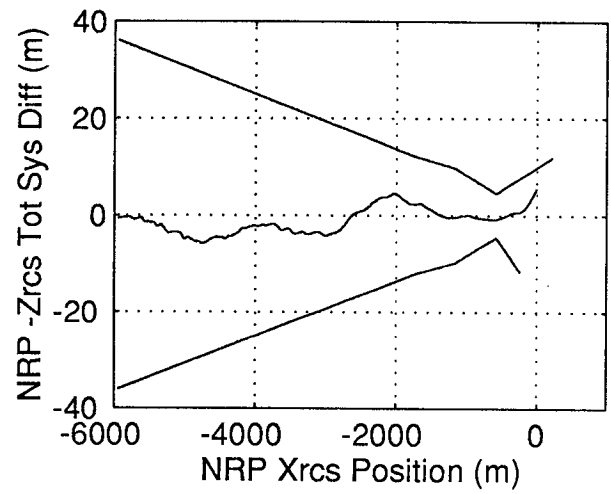
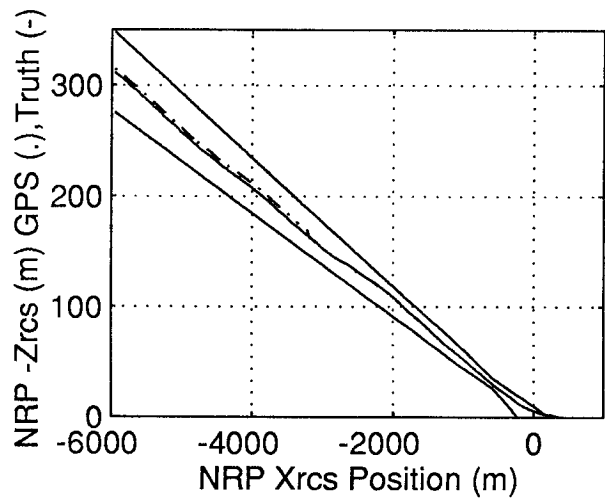
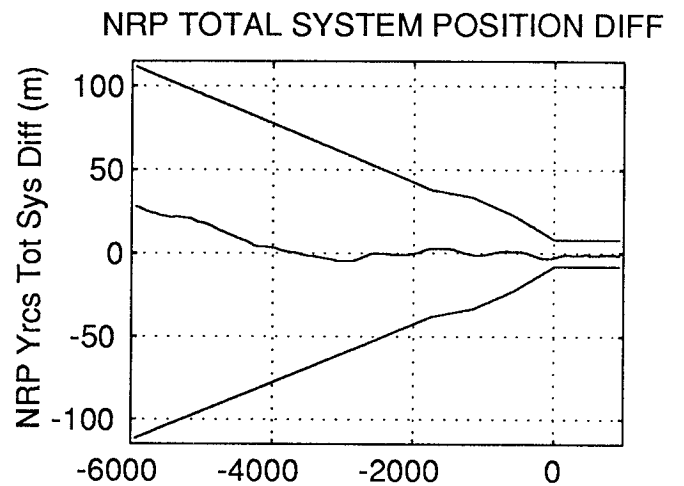
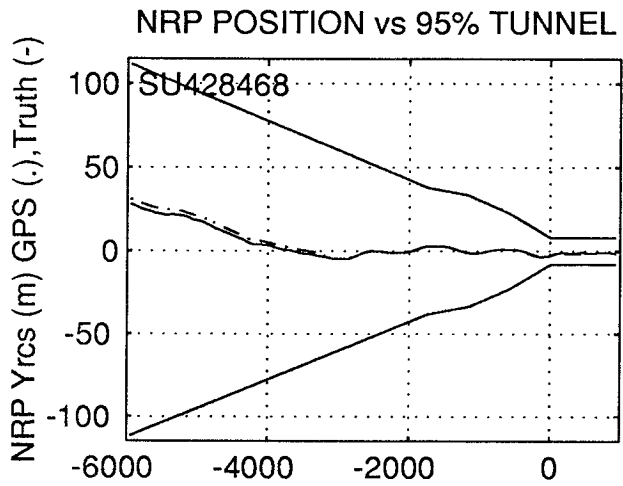
NRP Xrcs MEAN DIFFERENCE (m): 0.514
NRP Yrcs MEAN DIFFERENCE (m): -0.212
NRP Zrcs MEAN DIFFERENCE (m): -0.004

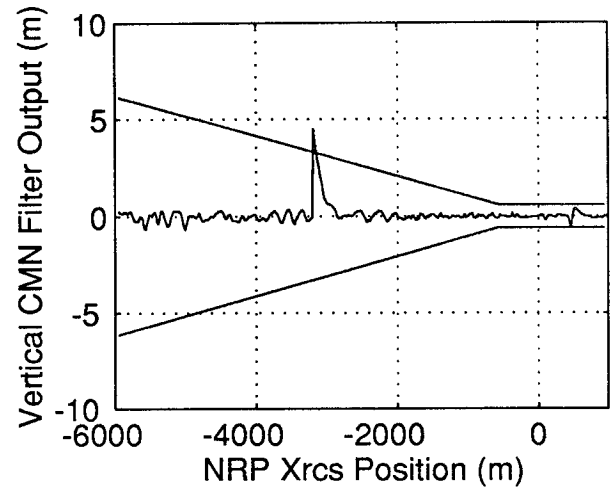
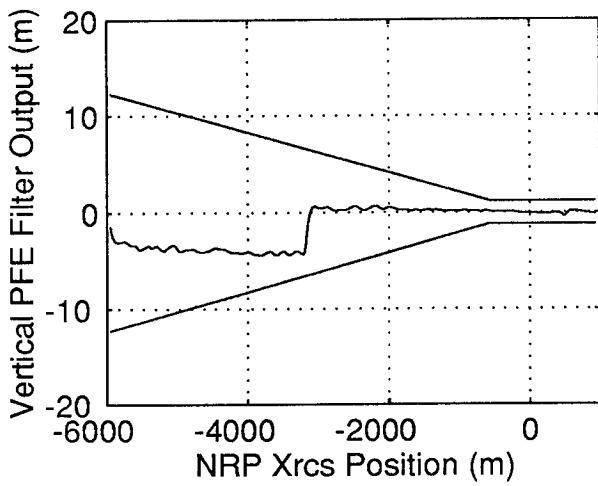
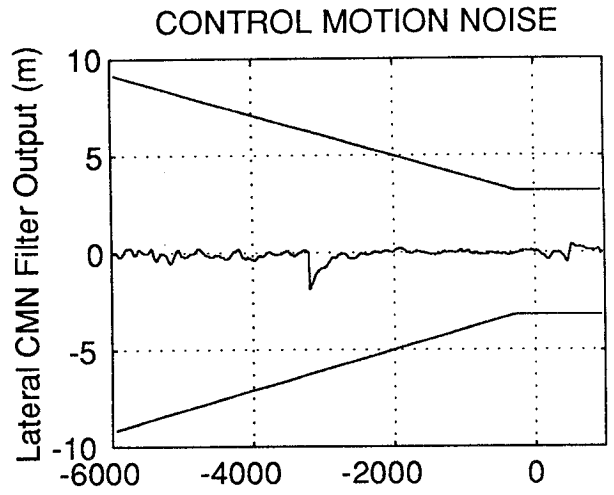
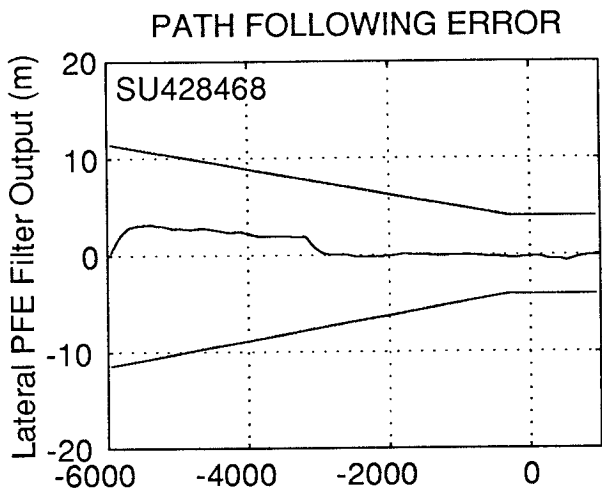
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.247
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.405
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.312

NRP Xrcs 2-RMS DIFFERENCE (m): 1.058
NRP Yrcs 2-RMS DIFFERENCE (m): 0.587
NRP Zrcs 2-RMS DIFFERENCE (m): 0.312

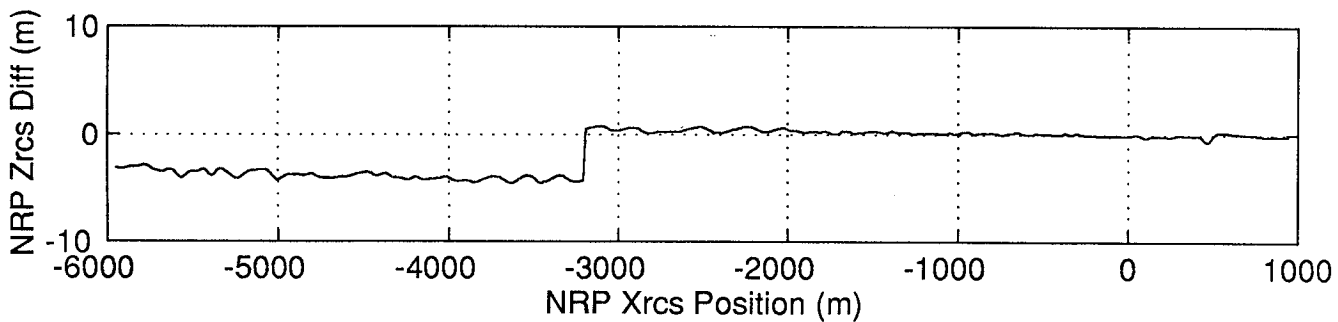
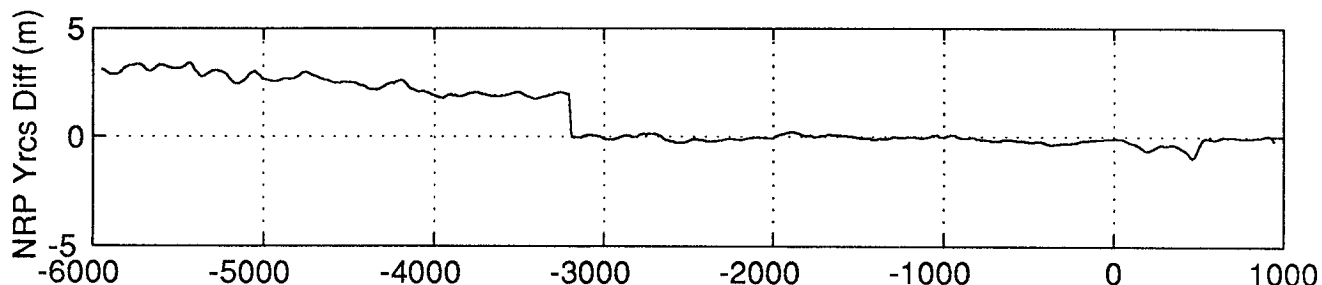
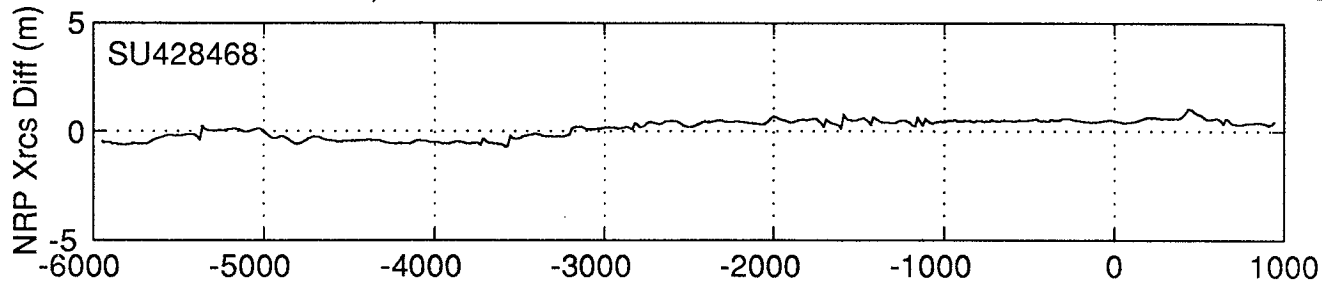
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 161.687
LGRP Yrcs POSITION (m): -0.457





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428470
START TIME: 250402.749
STOP TIME: 250522.499

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 4.2
MAXIMUM VDOP: 4.3
AVERAGE VDOP: 4.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.538
NRP Yrcs MEAN DIFFERENCE (m): -0.155
NRP Zrcs MEAN DIFFERENCE (m): 0.081

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.373
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.222
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.252

NRP Xrcs 2-RMS DIFFERENCE (m): 1.139
NRP Yrcs 2-RMS DIFFERENCE (m): 0.381
NRP Zrcs 2-RMS DIFFERENCE (m): 0.300

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 129.115
LGRP Yrcs POSITION (m): 0.682

APPROACH #: SU428470
START TIME: 250402.749
STOP TIME: 250522.499

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 4.2
MAXIMUM VDOP: 4.3
AVERAGE VDOP: 4.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

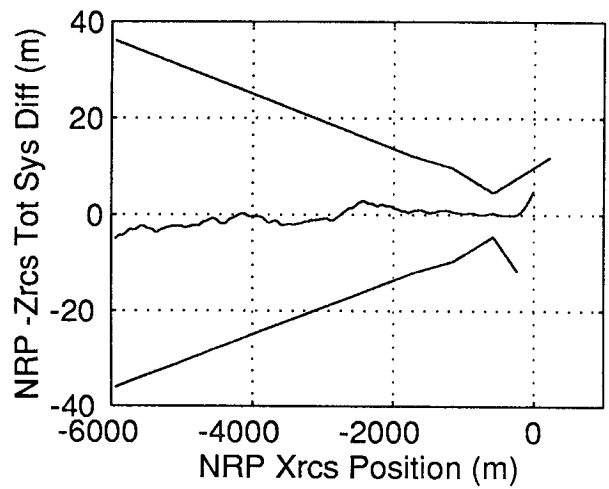
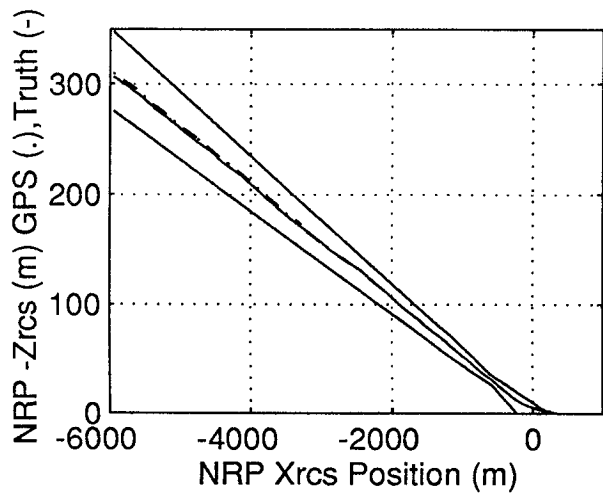
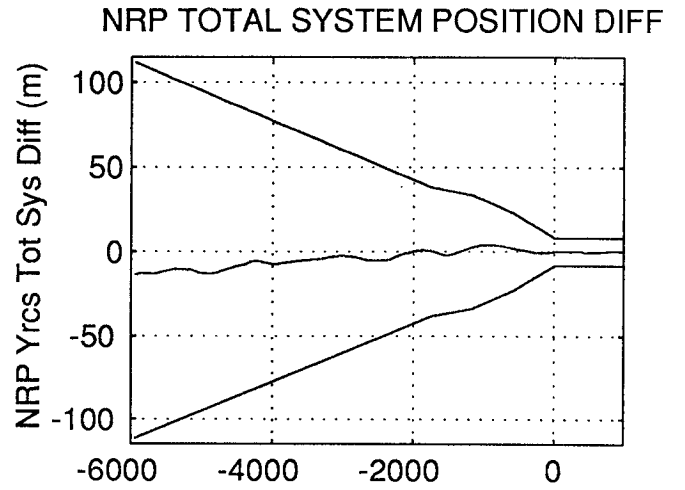
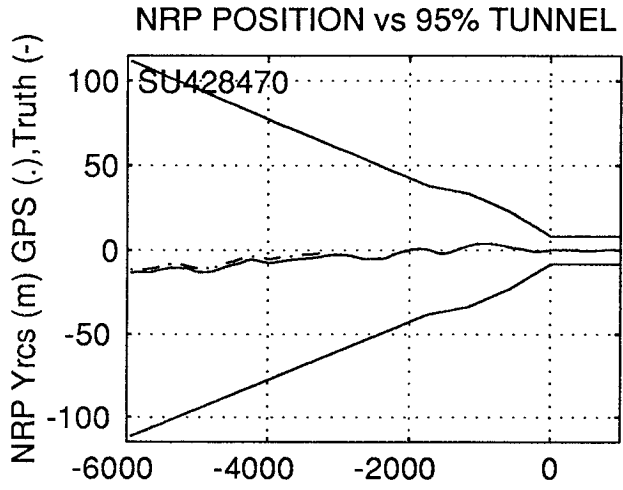
NRP Xrcs MEAN DIFFERENCE (m): 0.538
NRP Yrcs MEAN DIFFERENCE (m): -0.155
NRP Zrcs MEAN DIFFERENCE (m): 0.081

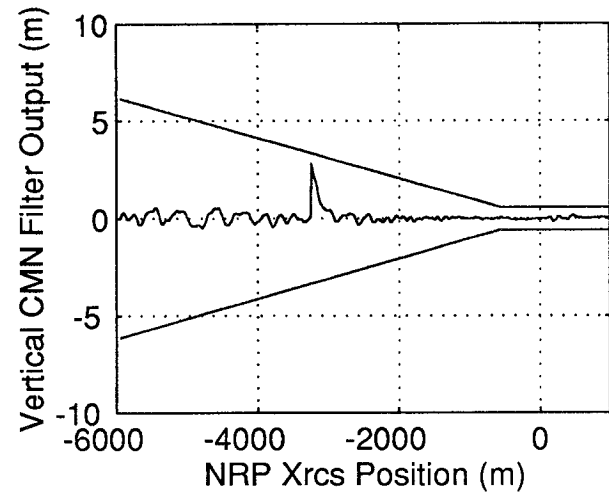
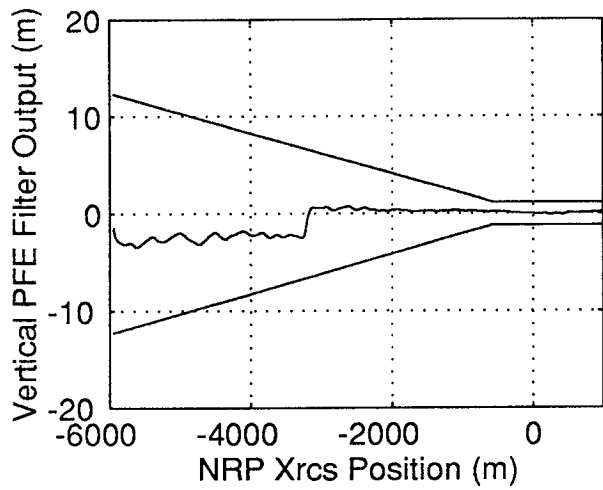
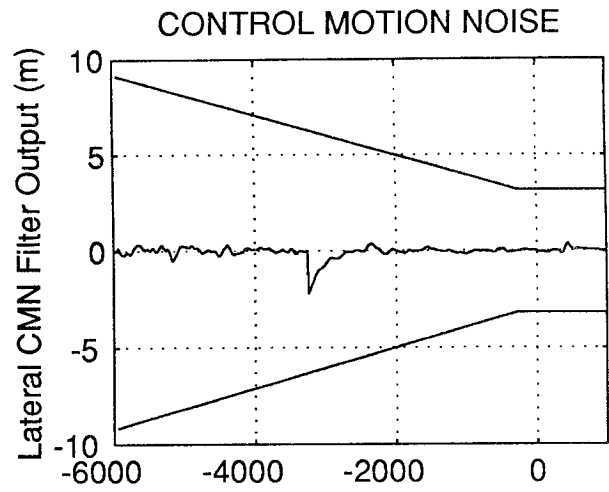
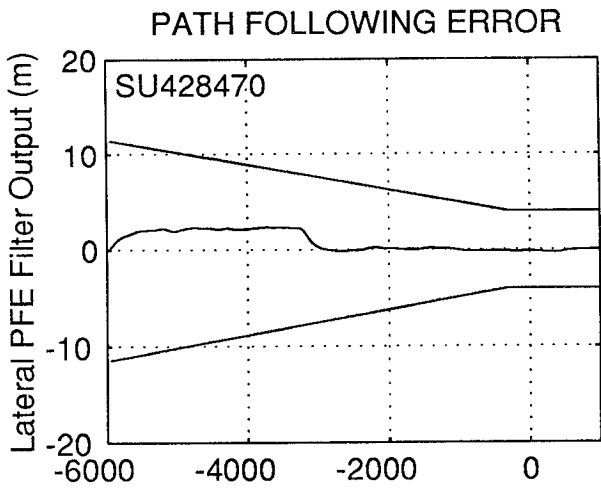
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.373
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.222
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.252

NRP Xrcs 2-RMS DIFFERENCE (m): 1.139
NRP Yrcs 2-RMS DIFFERENCE (m): 0.381
NRP Zrcs 2-RMS DIFFERENCE (m): 0.300

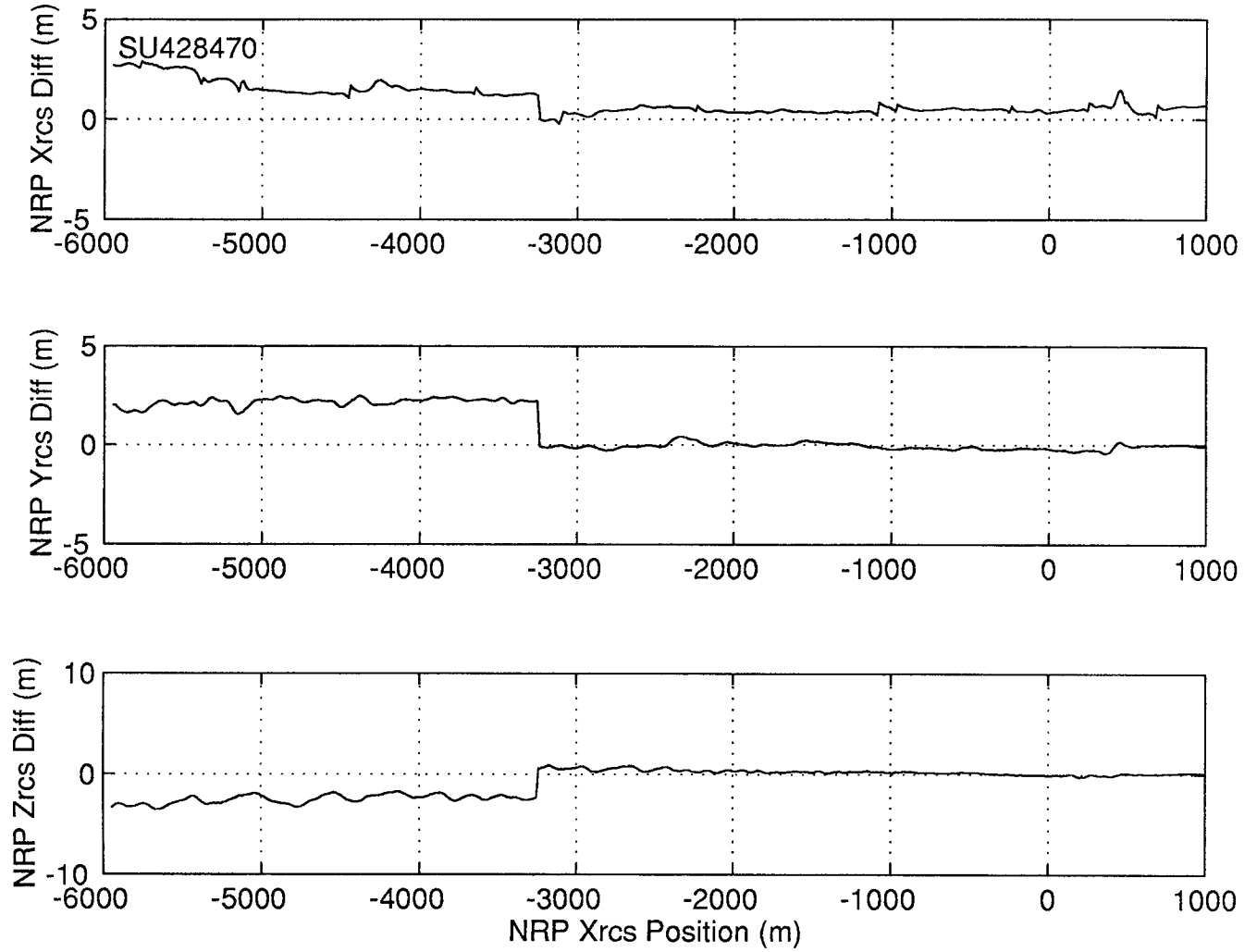
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 129.115
LGRP Yrcs POSITION (m): 0.682





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428502
START TIME: 321140.624
STOP TIME: 321247.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.1
MAXIMUM VDOP: 5.1
AVERAGE VDOP: 5.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.434
NRP Yrcs MEAN DIFFERENCE (m): -0.256
NRP Zrcs MEAN DIFFERENCE (m): 0.082

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.370
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.383
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.200

NRP Xrcs 2-RMS DIFFERENCE (m): 0.944
NRP Yrcs 2-RMS DIFFERENCE (m): 0.639
NRP Zrcs 2-RMS DIFFERENCE (m): 0.259

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 85.159
LGRP Yrcs POSITION (m): 1.071

APPROACH #: SU428502
START TIME: 321140.624
STOP TIME: 321247.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.1
MAXIMUM VDOP: 5.1
AVERAGE VDOP: 5.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

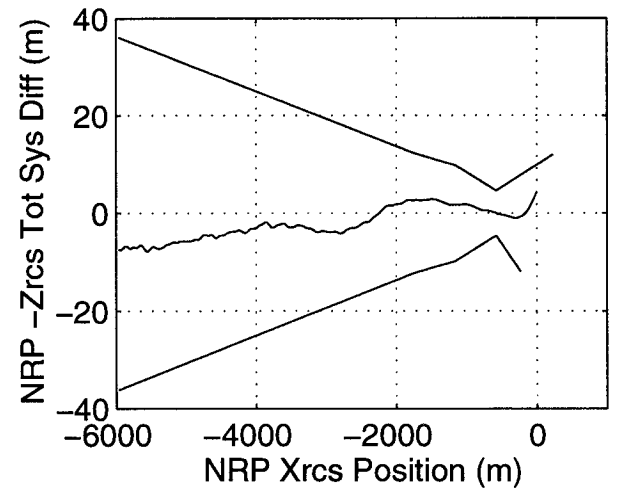
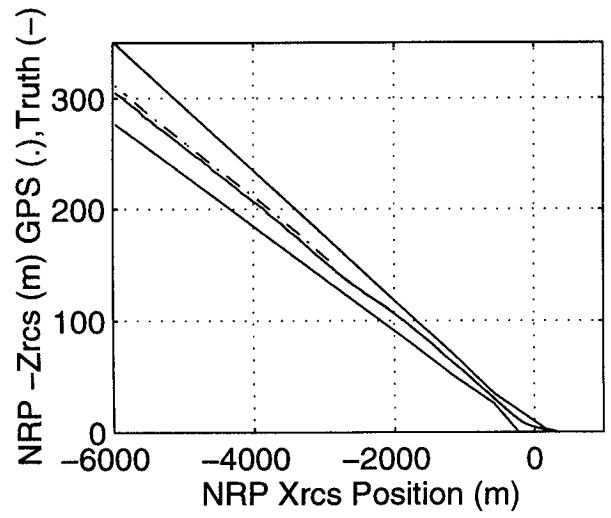
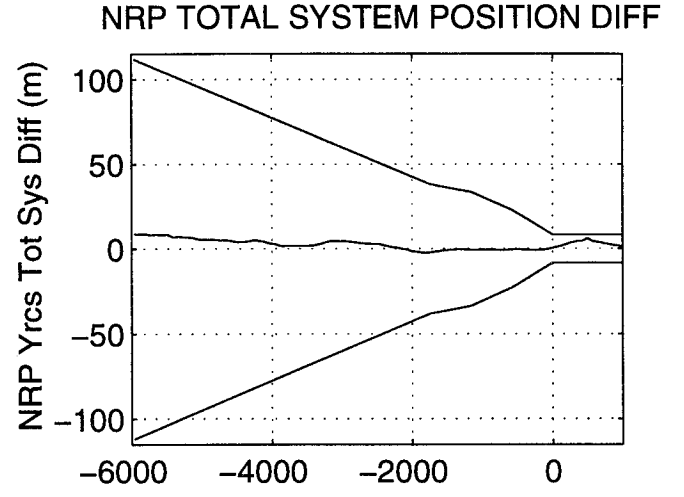
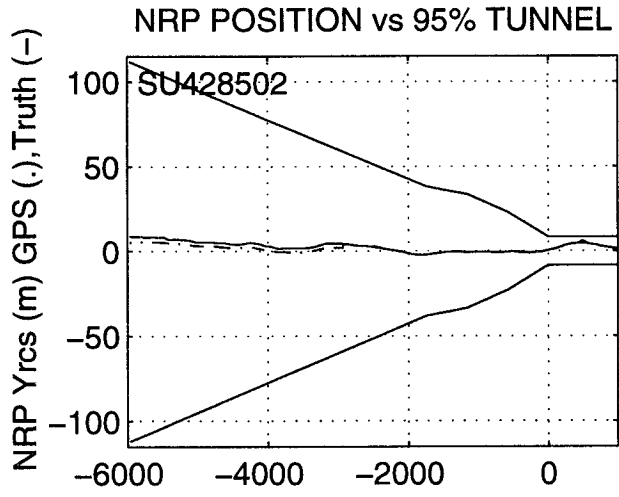
NRP Xrcs MEAN DIFFERENCE (m): 0.434
NRP Yrcs MEAN DIFFERENCE (m): -0.256
NRP Zrcs MEAN DIFFERENCE (m): 0.082

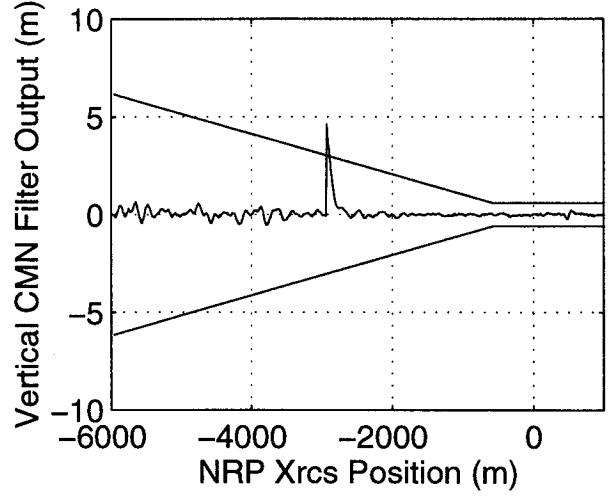
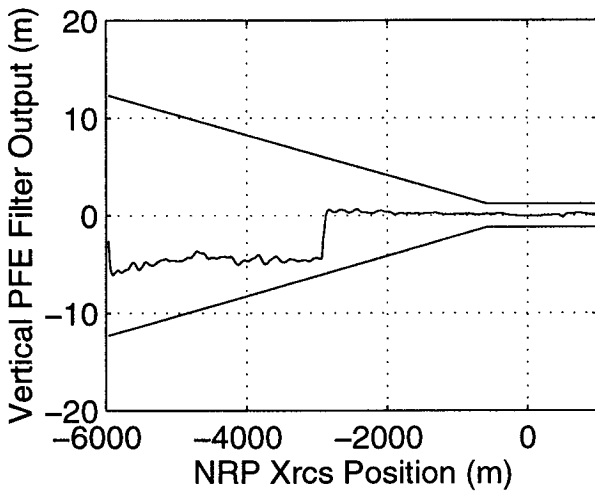
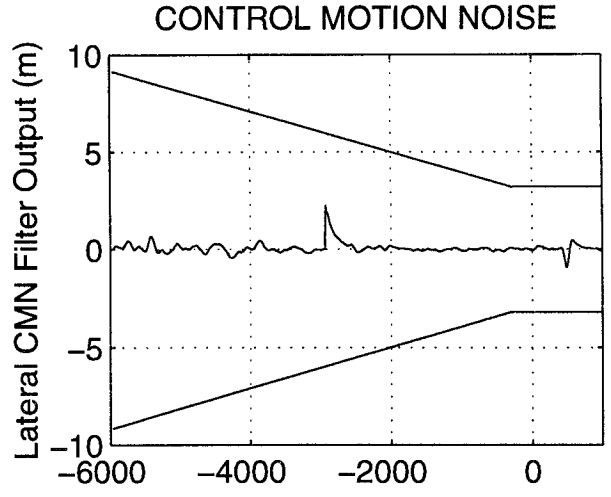
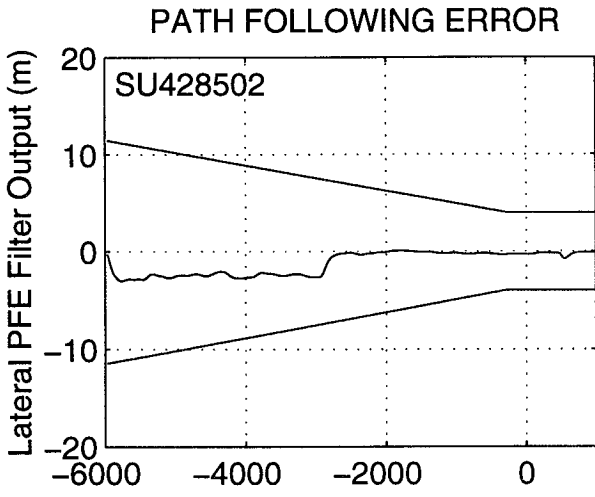
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.370
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.383
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.200

NRP Xrcs 2-RMS DIFFERENCE (m): 0.944
NRP Yrcs 2-RMS DIFFERENCE (m): 0.639
NRP Zrcs 2-RMS DIFFERENCE (m): 0.259

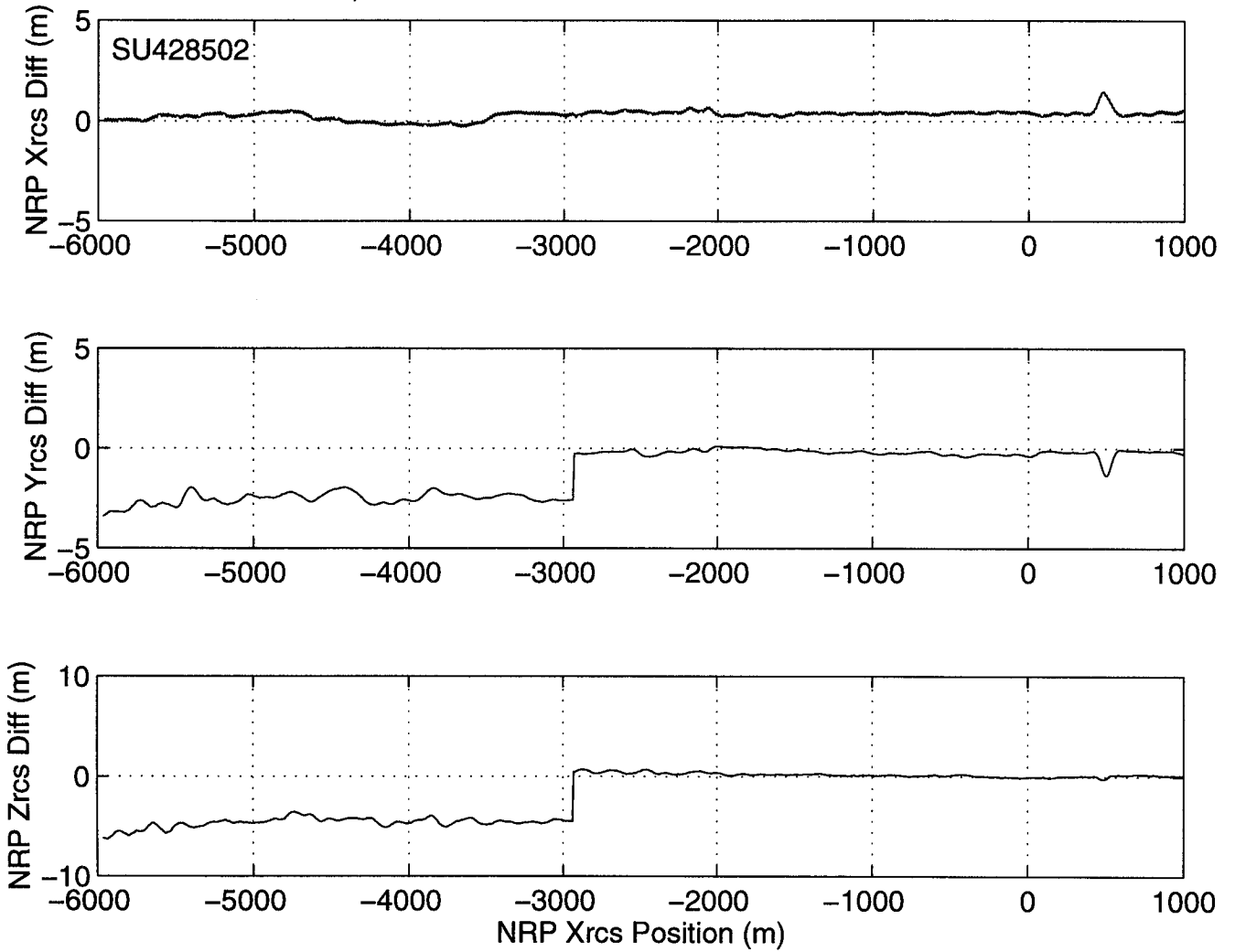
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 85.159
LGRP Yrcs POSITION (m): 1.071





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428504
START TIME: 321575.249
STOP TIME: 321683.999

MINIMUM HDOP: 2.6
MAXIMUM HDOP: 2.6
AVERAGE HDOP: 2.6

MINIMUM VDOP: 4.9
MAXIMUM VDOP: 4.9
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.299
NRP Yrcs MEAN DIFFERENCE (m): -0.063
NRP Zrcs MEAN DIFFERENCE (m): 0.104

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.167
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.131
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.220

NRP Xrcs 2-RMS DIFFERENCE (m): 0.620
NRP Yrcs 2-RMS DIFFERENCE (m): 0.182
NRP Zrcs 2-RMS DIFFERENCE (m): 0.303

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 167.032
LGRP Yrcs POSITION (m): 0.068

APPROACH #: SU428504
START TIME: 321575.249
STOP TIME: 321683.999

MINIMUM HDOP: 2.6
MAXIMUM HDOP: 2.6
AVERAGE HDOP: 2.6

MINIMUM VDOP: 4.9
MAXIMUM VDOP: 4.9
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

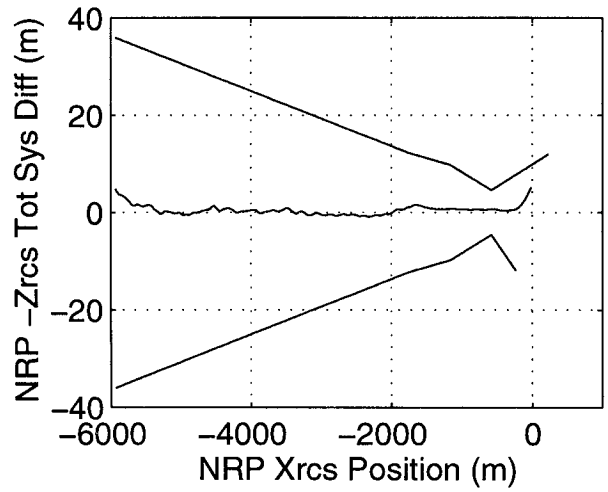
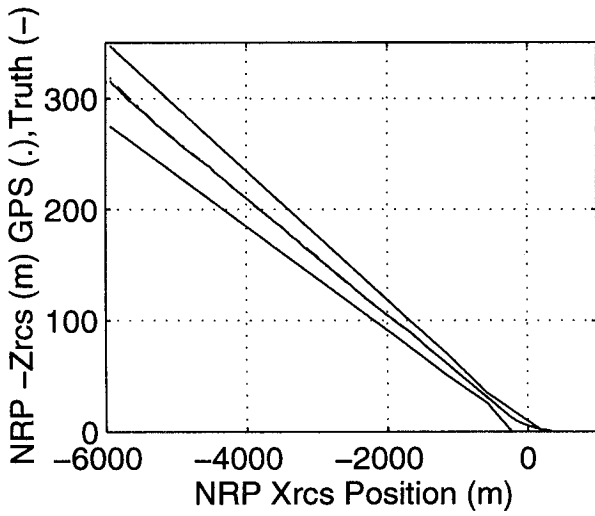
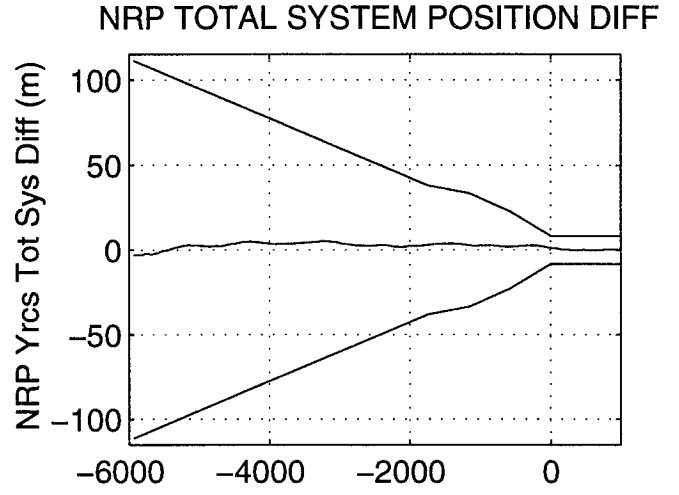
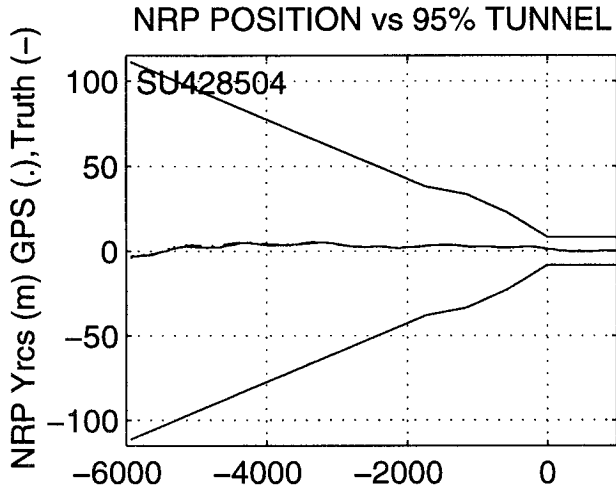
NRP Xrcs MEAN DIFFERENCE (m): 0.299
NRP Yrcs MEAN DIFFERENCE (m): -0.063
NRP Zrcs MEAN DIFFERENCE (m): 0.104

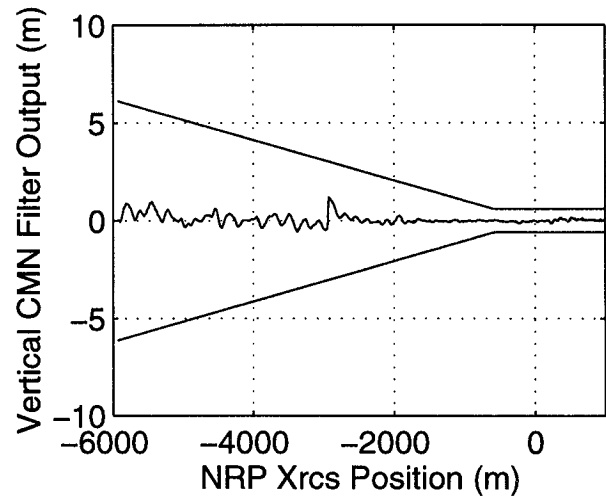
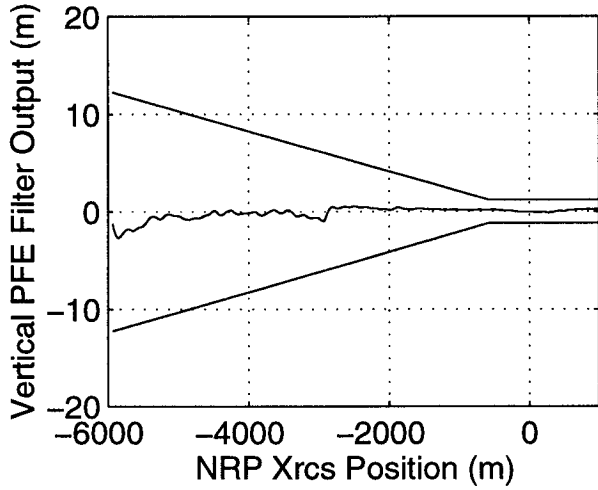
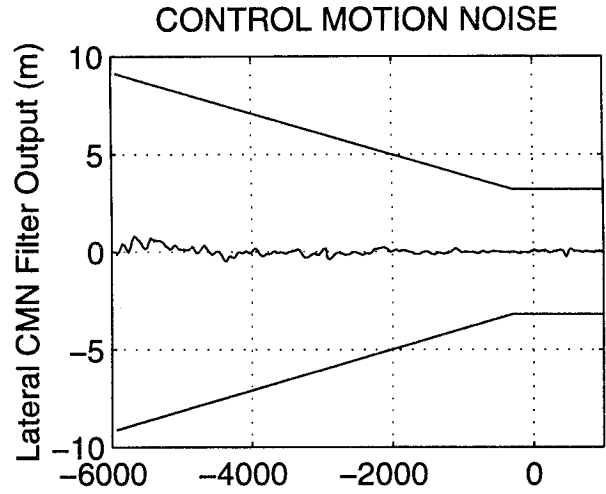
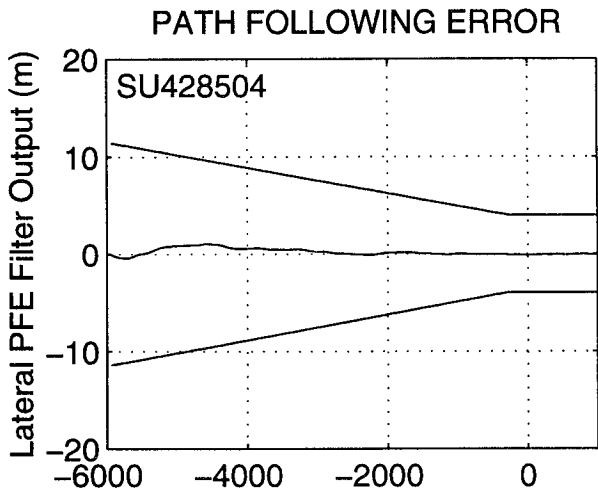
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.167
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.131
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.220

NRP Xrcs 2-RMS DIFFERENCE (m): 0.620
NRP Yrcs 2-RMS DIFFERENCE (m): 0.182
NRP Zrcs 2-RMS DIFFERENCE (m): 0.303

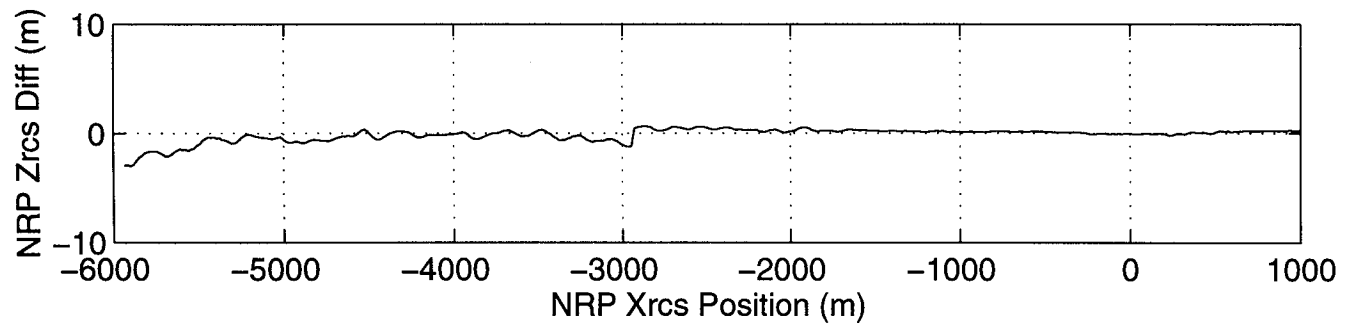
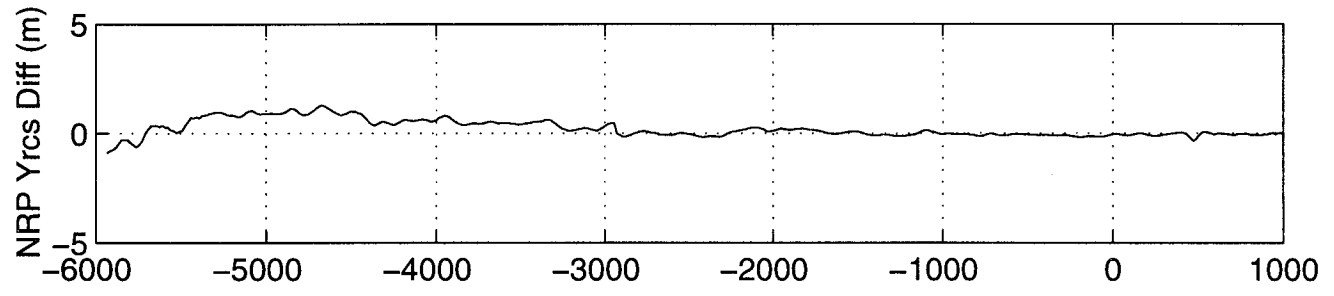
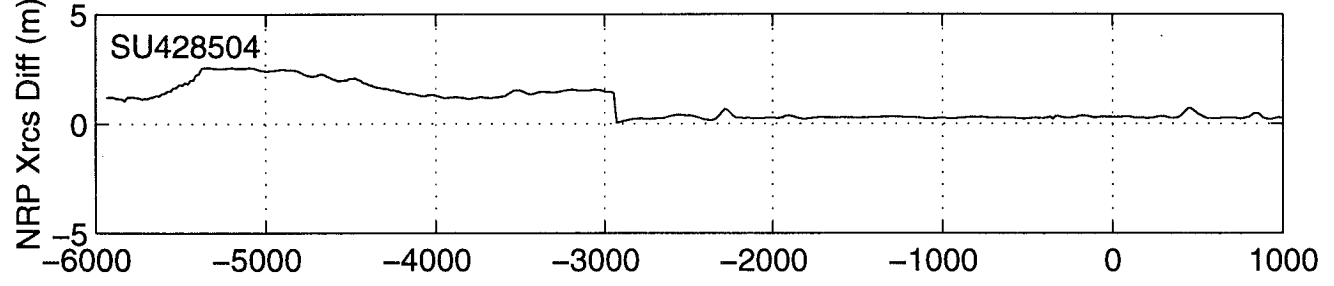
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 167.032
LGRP Yrcs POSITION (m): 0.068





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428506
START TIME: 322268.999
STOP TIME: 322376.499

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.3
MAXIMUM VDOP: 4.4
AVERAGE VDOP: 4.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.452
NRP Yrcs MEAN DIFFERENCE (m): -0.204
NRP Zrcs MEAN DIFFERENCE (m): 0.251

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.239
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.173
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.292

NRP Xrcs 2-RMS DIFFERENCE (m): 0.935
NRP Yrcs 2-RMS DIFFERENCE (m): 0.444
NRP Zrcs 2-RMS DIFFERENCE (m): 0.580

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 133.697
LGRP Yrcs POSITION (m): 1.379

APPROACH #: SU428506
START TIME: 322268.999
STOP TIME: 322376.499

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.3
MAXIMUM VDOP: 4.4
AVERAGE VDOP: 4.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

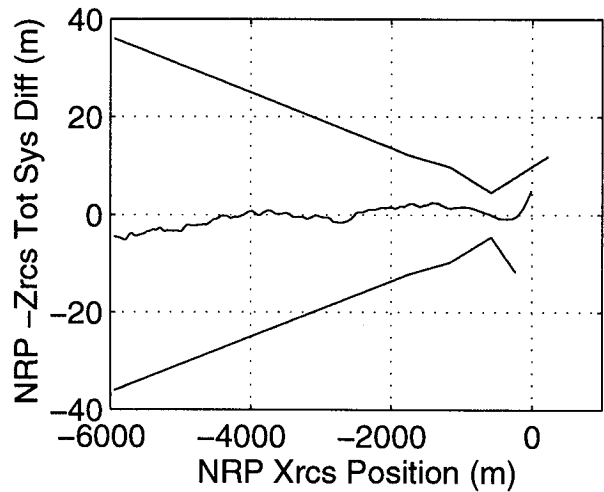
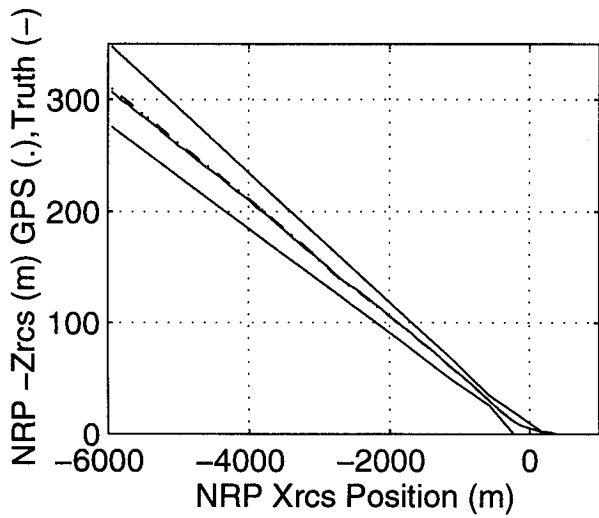
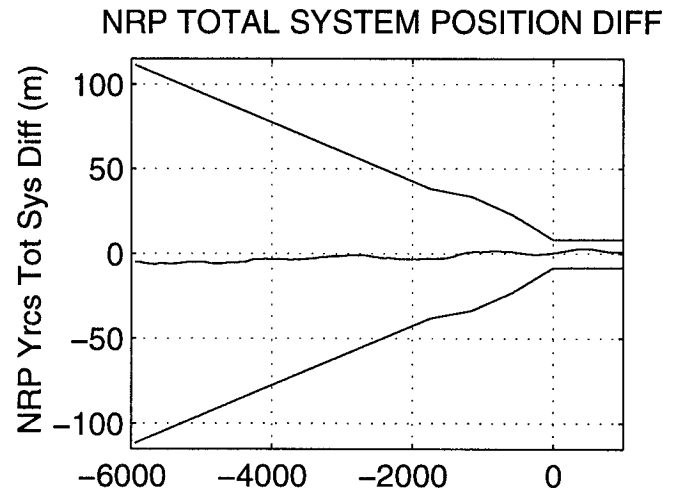
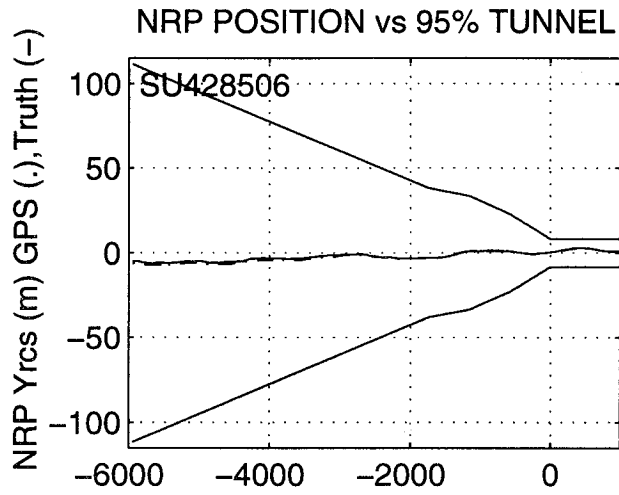
NRP Xrcs MEAN DIFFERENCE (m): 0.452
NRP Yrcs MEAN DIFFERENCE (m): -0.204
NRP Zrcs MEAN DIFFERENCE (m): 0.251

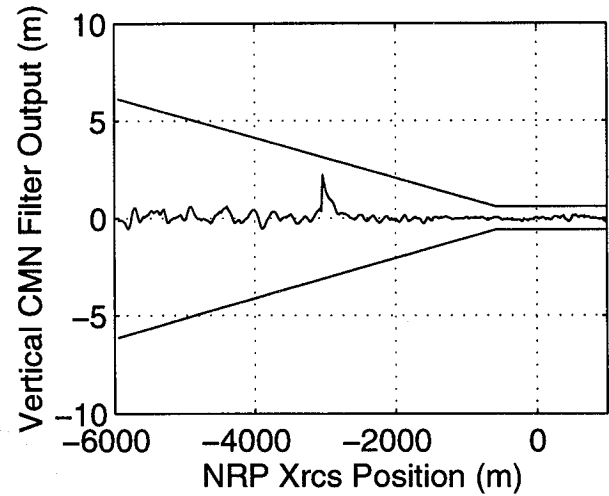
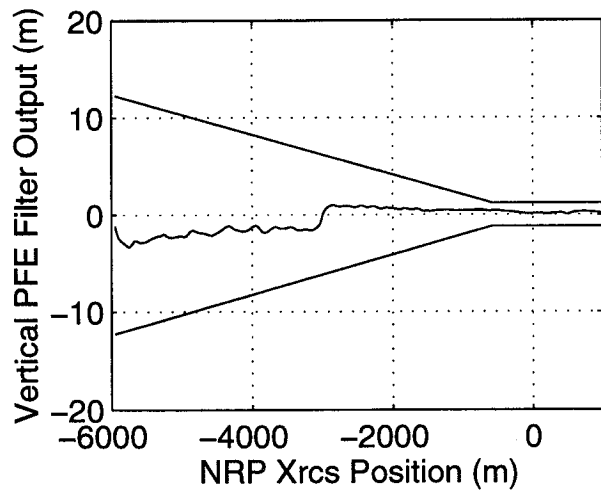
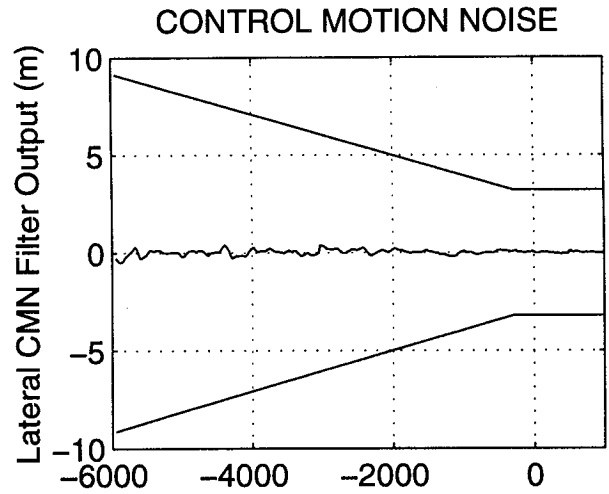
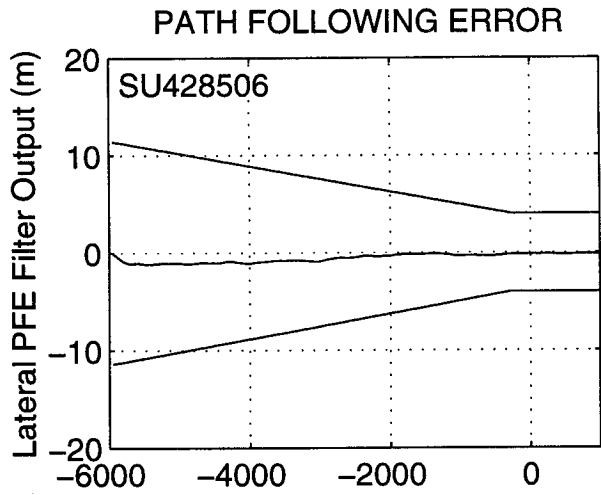
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.239
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.173
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.292

NRP Xrcs 2-RMS DIFFERENCE (m): 0.935
NRP Yrcs 2-RMS DIFFERENCE (m): 0.444
NRP Zrcs 2-RMS DIFFERENCE (m): 0.580

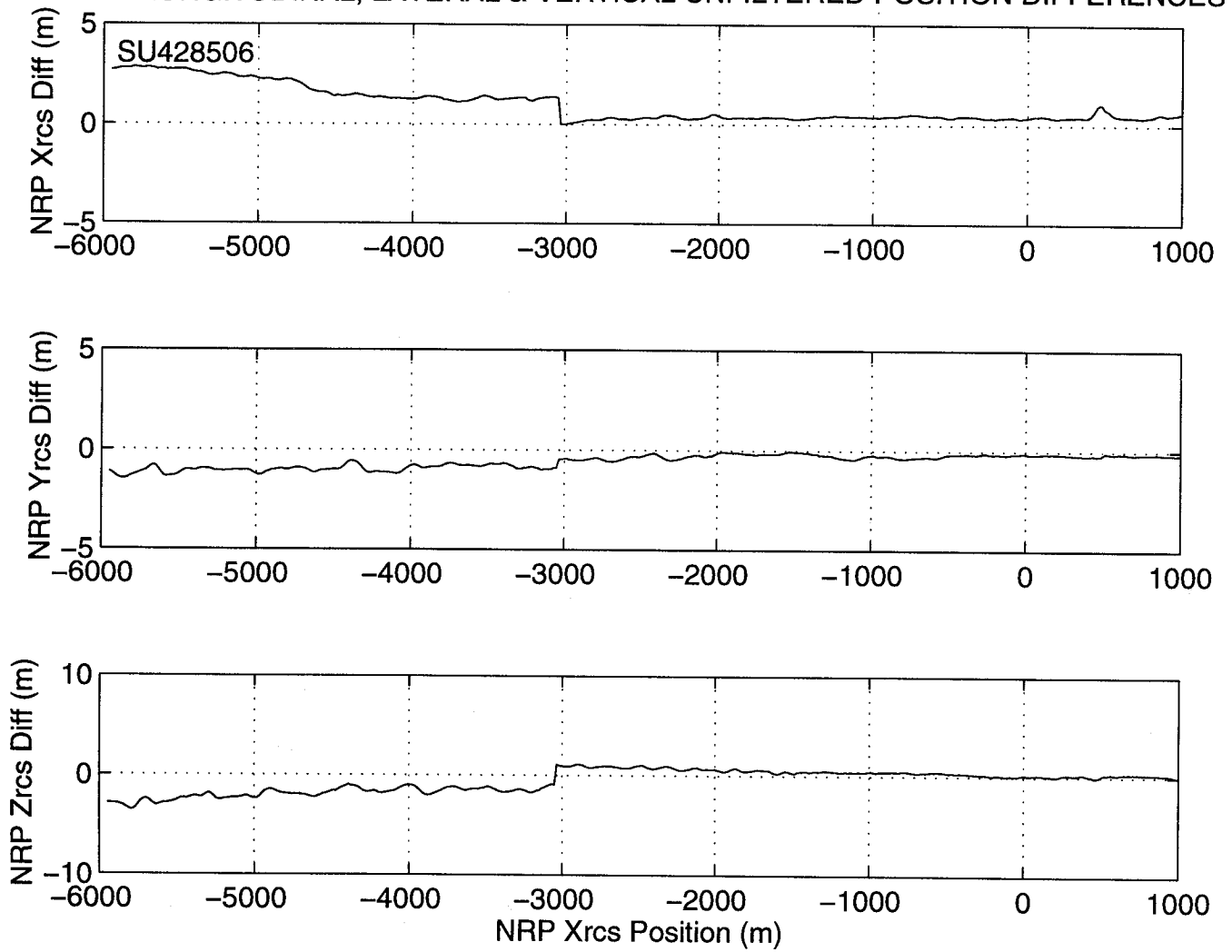
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 133.697
LGRP Yrcs POSITION (m): 1.379





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428508
START TIME: 322668.999
STOP TIME: 322777.249

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.9
MAXIMUM VDOP: 4.0
AVERAGE VDOP: 4.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.472
NRP Yrcs MEAN DIFFERENCE (m): -0.138
NRP Zrcs MEAN DIFFERENCE (m): 0.138

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.240
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.158
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.248

NRP Xrcs 2-RMS DIFFERENCE (m): 0.974
NRP Yrcs 2-RMS DIFFERENCE (m): 0.318
NRP Zrcs 2-RMS DIFFERENCE (m): 0.371

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 115.686
LGRP Yrcs POSITION (m): -0.934

APPROACH #: SU428508
START TIME: 322668.999
STOP TIME: 322777.249

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.9
MAXIMUM VDOP: 4.0
AVERAGE VDOP: 4.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

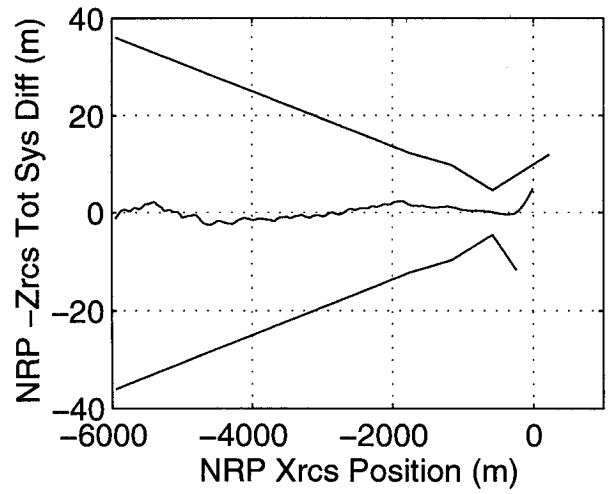
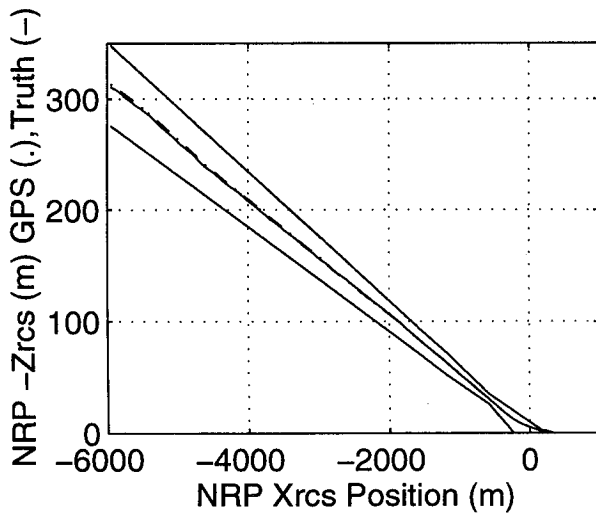
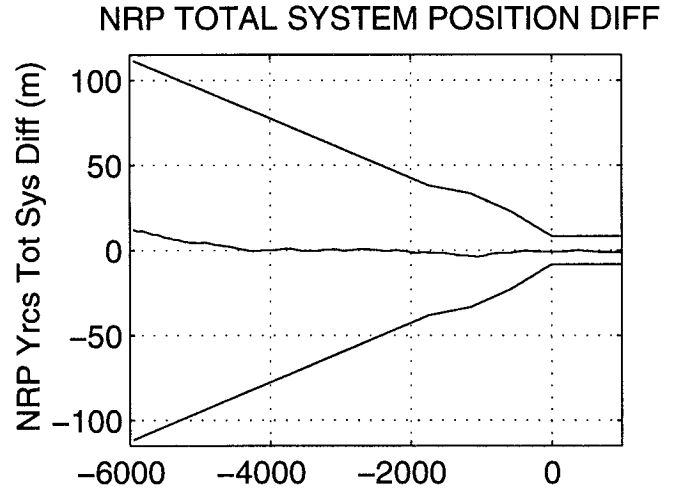
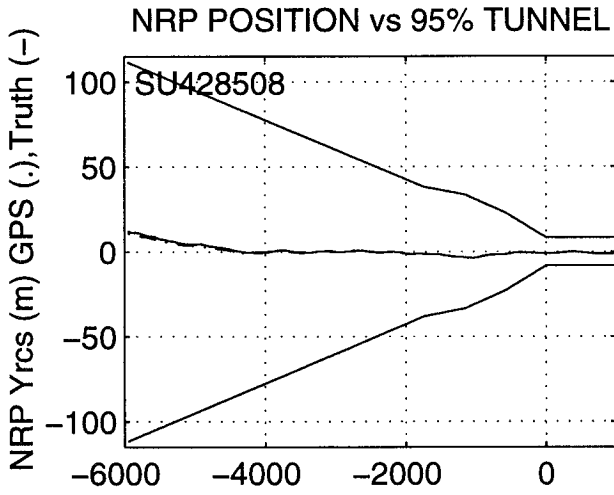
NRP Xrcs MEAN DIFFERENCE (m): 0.472
NRP Yrcs MEAN DIFFERENCE (m): -0.138
NRP Zrcs MEAN DIFFERENCE (m): 0.138

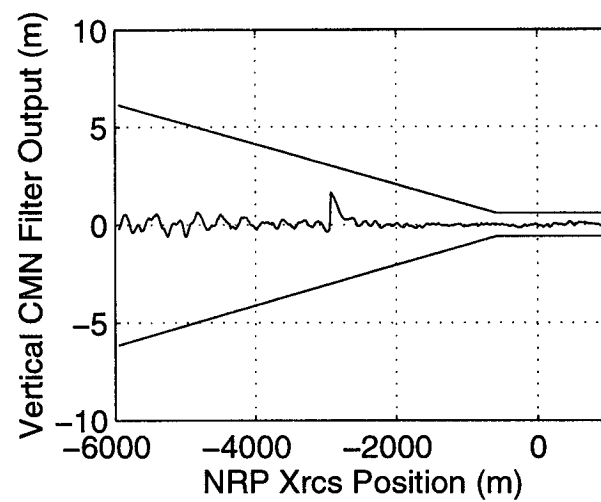
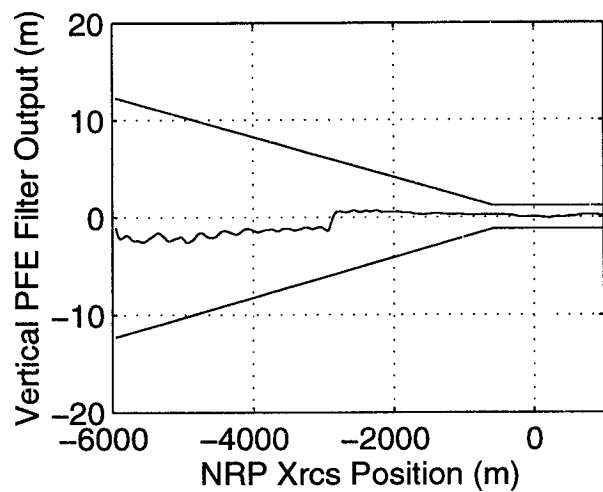
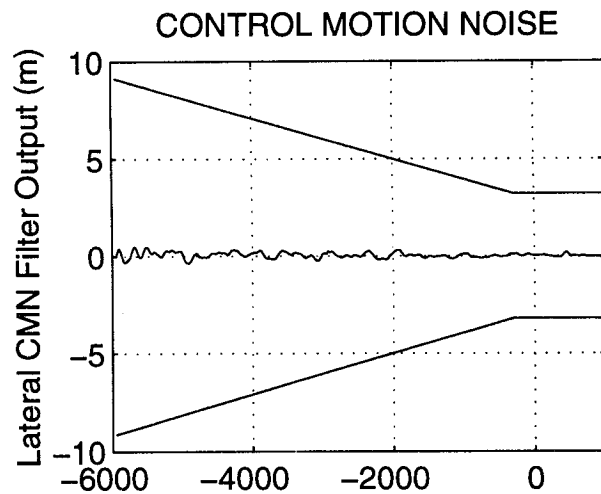
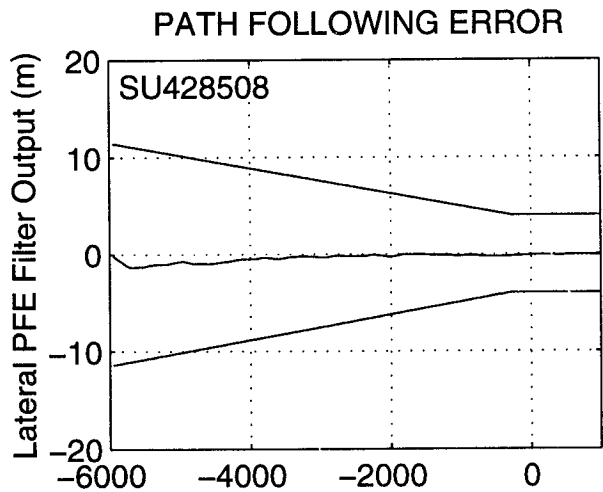
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.240
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.158
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.248

NRP Xrcs 2-RMS DIFFERENCE (m): 0.974
NRP Yrcs 2-RMS DIFFERENCE (m): 0.318
NRP Zrcs 2-RMS DIFFERENCE (m): 0.371

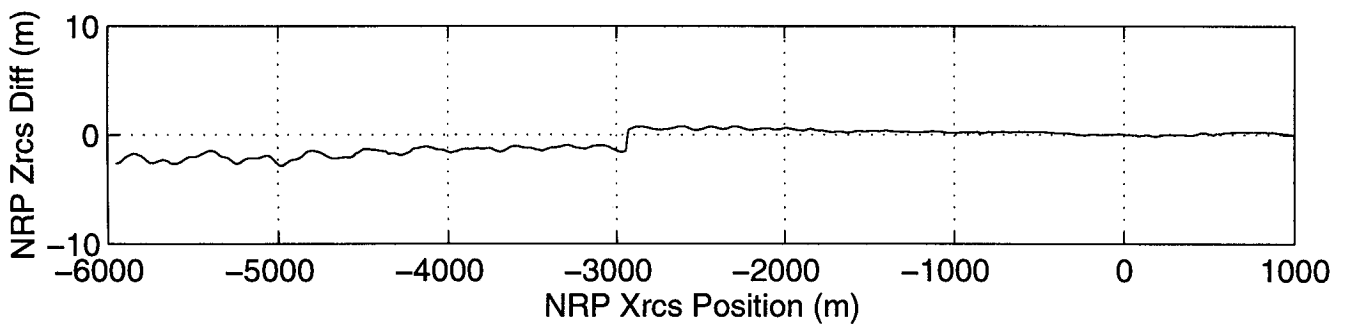
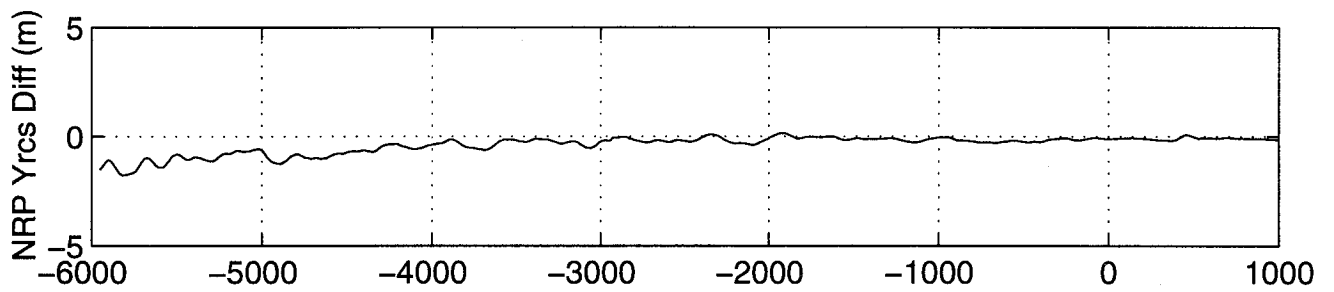
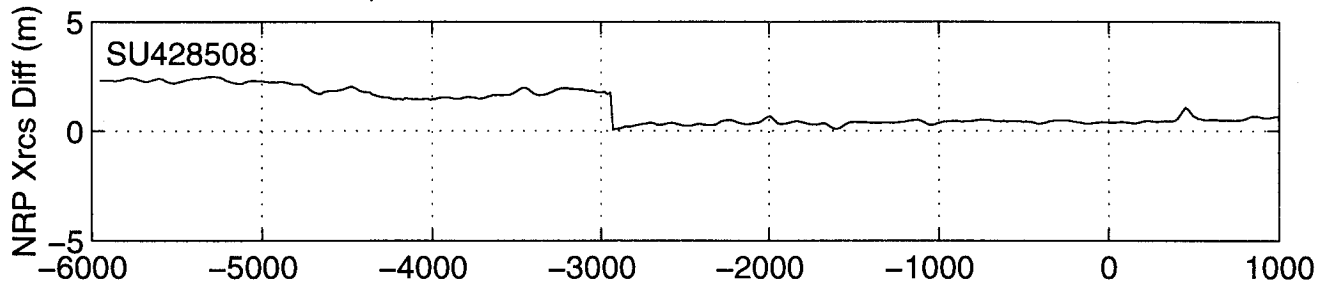
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 115.686
LGRP Yrcs POSITION (m): -0.934





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428510
START TIME: 323056.999
STOP TIME: 323165.749

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.7
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.440
NRP Yrcs MEAN DIFFERENCE (m): -0.211
NRP Zrcs MEAN DIFFERENCE (m): 0.082

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.140
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.232

NRP Xrcs 2-RMS DIFFERENCE (m): 0.891
NRP Yrcs 2-RMS DIFFERENCE (m): 0.466
NRP Zrcs 2-RMS DIFFERENCE (m): 0.283

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 162.269
LGRP Yrcs POSITION (m): -3.032

APPROACH #: SU428510
START TIME: 323056.999
STOP TIME: 323165.749

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.7
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

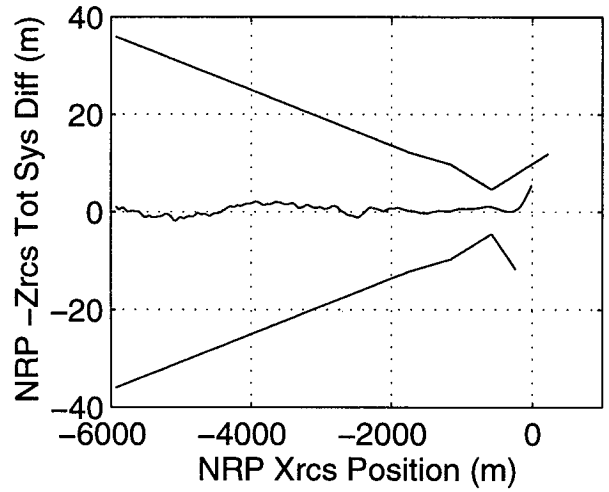
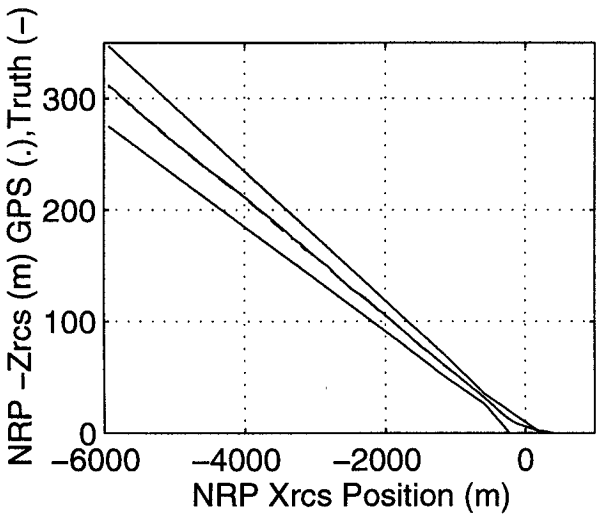
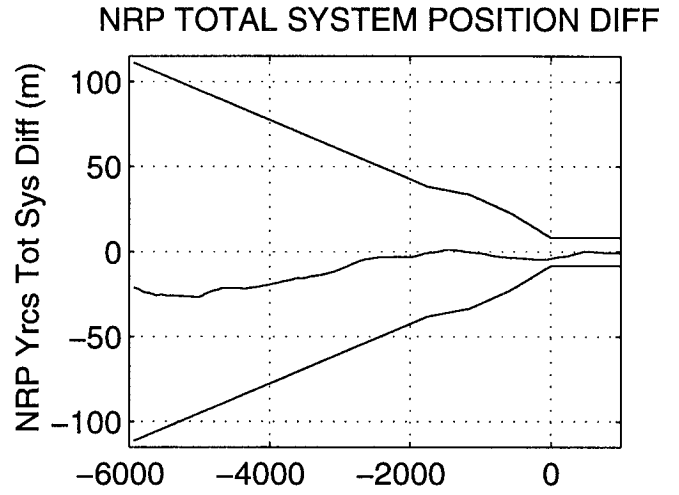
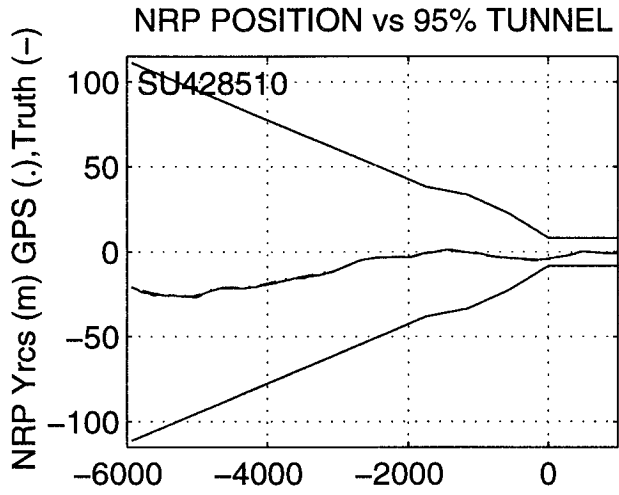
NRP Xrcs MEAN DIFFERENCE (m): 0.440
NRP Yrcs MEAN DIFFERENCE (m): -0.211
NRP Zrcs MEAN DIFFERENCE (m): 0.082

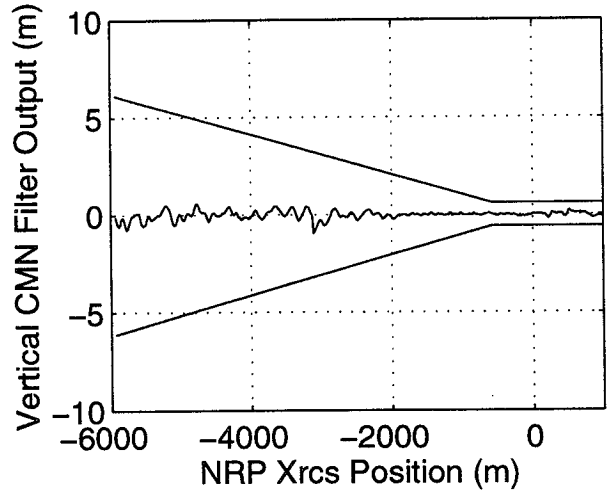
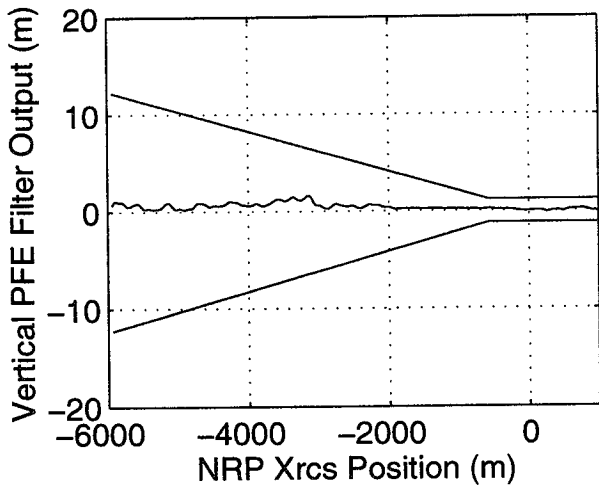
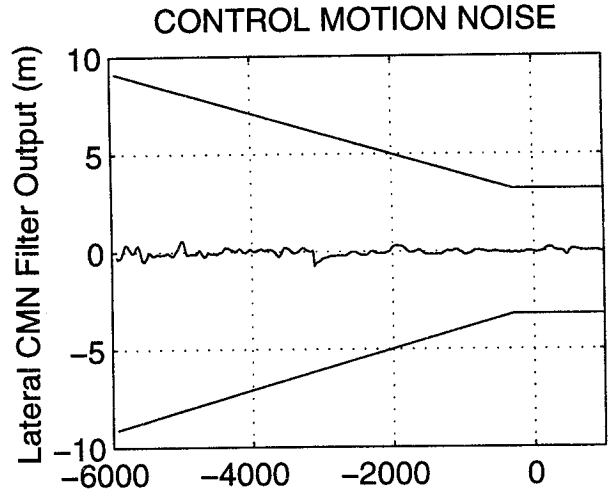
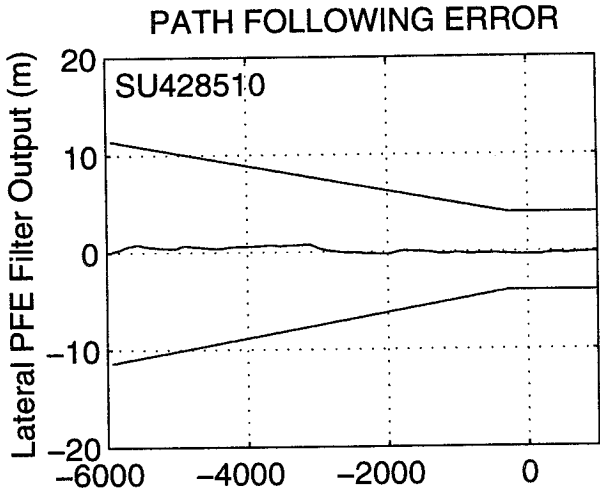
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.140
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.232

NRP Xrcs 2-RMS DIFFERENCE (m): 0.891
NRP Yrcs 2-RMS DIFFERENCE (m): 0.466
NRP Zrcs 2-RMS DIFFERENCE (m): 0.283

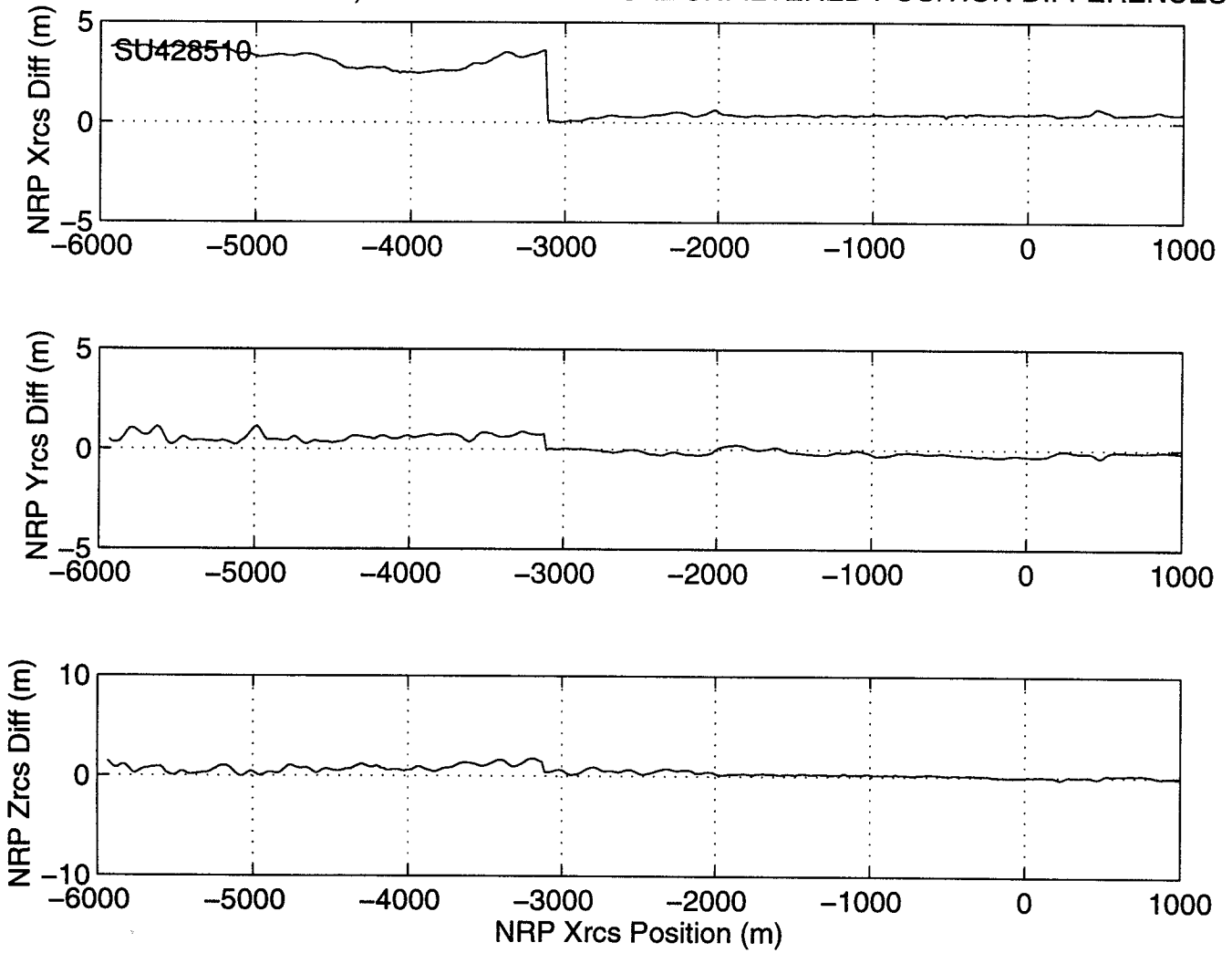
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 162.269
LGRP Yrcs POSITION (m): -3.032





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428512
START TIME: 323478.749
STOP TIME: 323587.499

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.5
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.349
NRP Yrcs MEAN DIFFERENCE (m): -0.240
NRP Zrcs MEAN DIFFERENCE (m): 0.000

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.215
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.378
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.172

NRP Xrcs 2-RMS DIFFERENCE (m): 0.730
NRP Yrcs 2-RMS DIFFERENCE (m): 0.611
NRP Zrcs 2-RMS DIFFERENCE (m): 0.172

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 139.993
LGRP Yrcs POSITION (m): 3.610

APPROACH #: SU428512
START TIME: 323478.749
STOP TIME: 323587.499

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.5
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

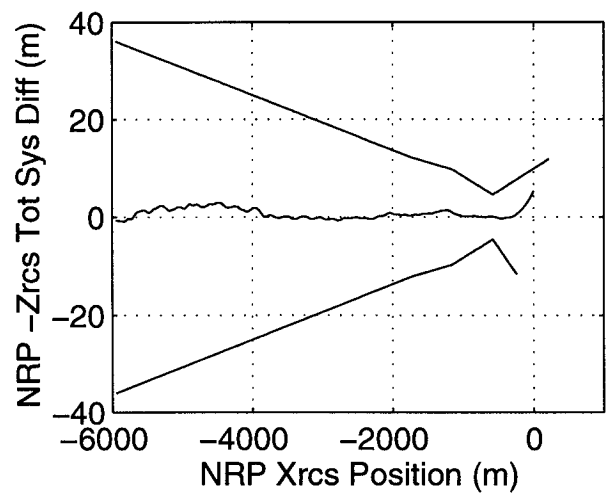
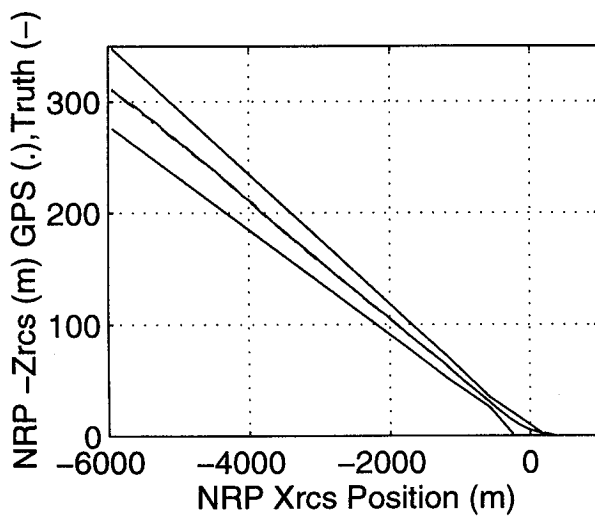
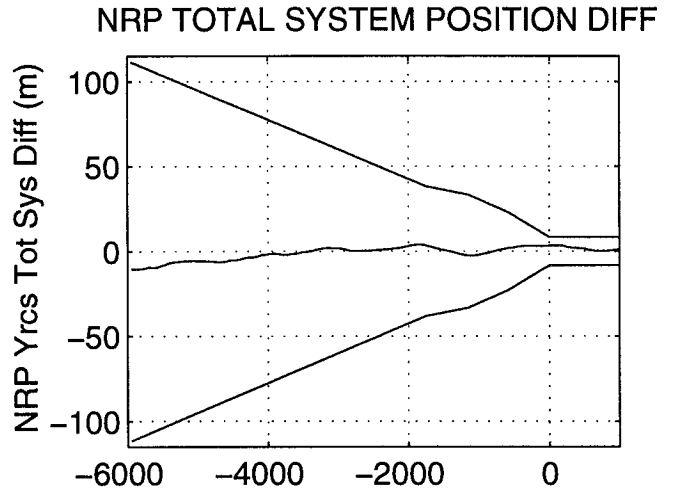
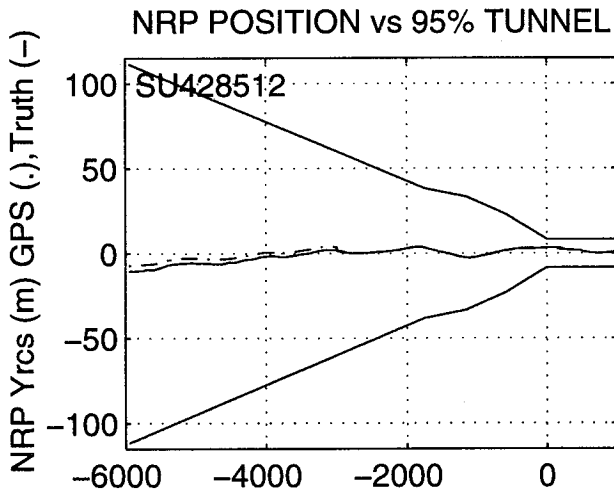
NRP Xrcs MEAN DIFFERENCE (m): 0.349
NRP Yrcs MEAN DIFFERENCE (m): -0.240
NRP Zrcs MEAN DIFFERENCE (m): 0.000

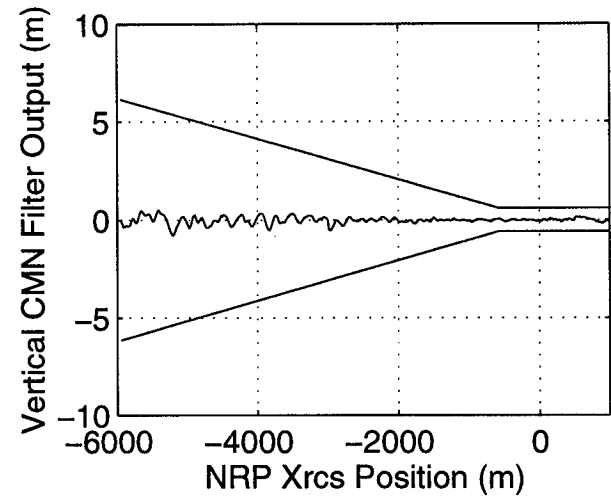
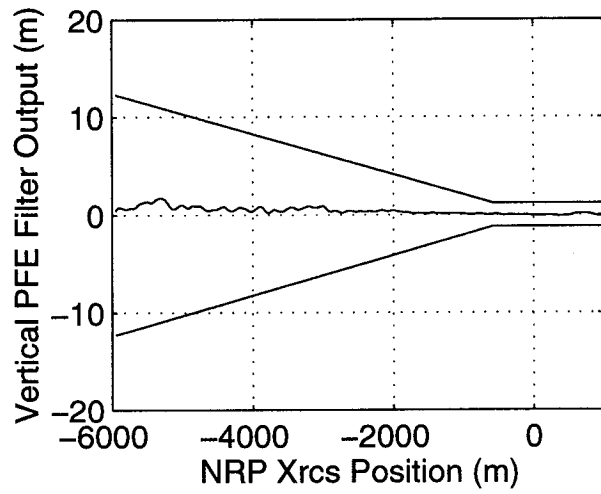
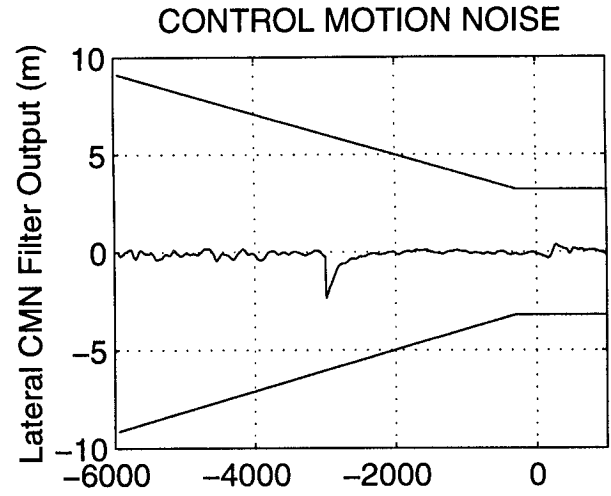
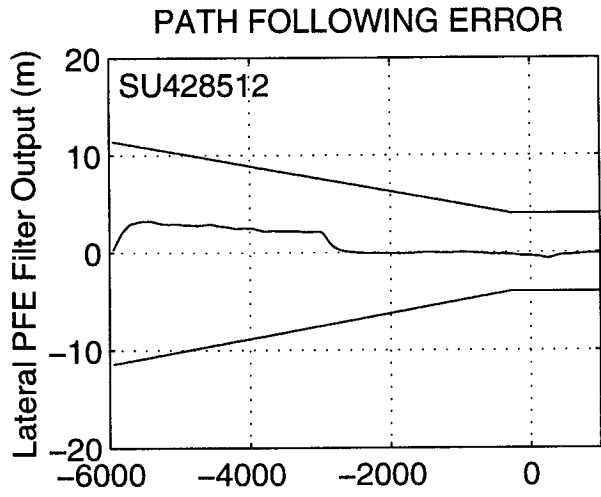
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.215
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.378
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.172

NRP Xrcs 2-RMS DIFFERENCE (m): 0.730
NRP Yrcs 2-RMS DIFFERENCE (m): 0.611
NRP Zrcs 2-RMS DIFFERENCE (m): 0.172

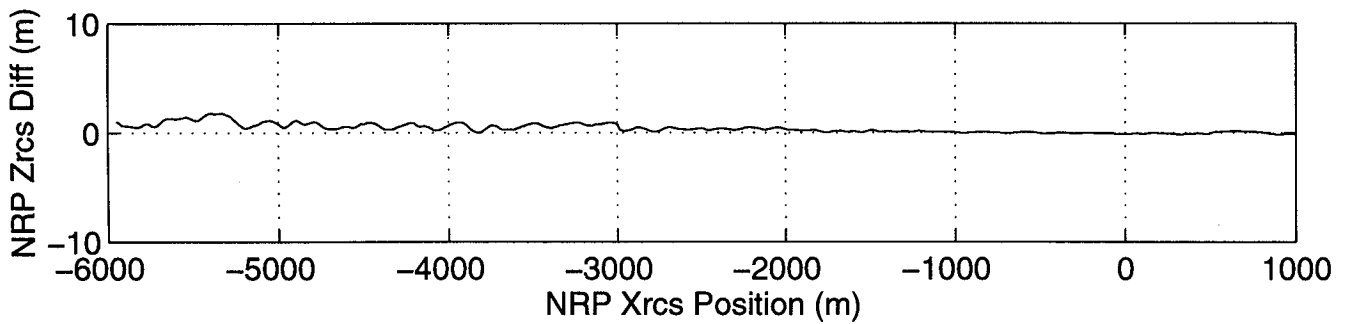
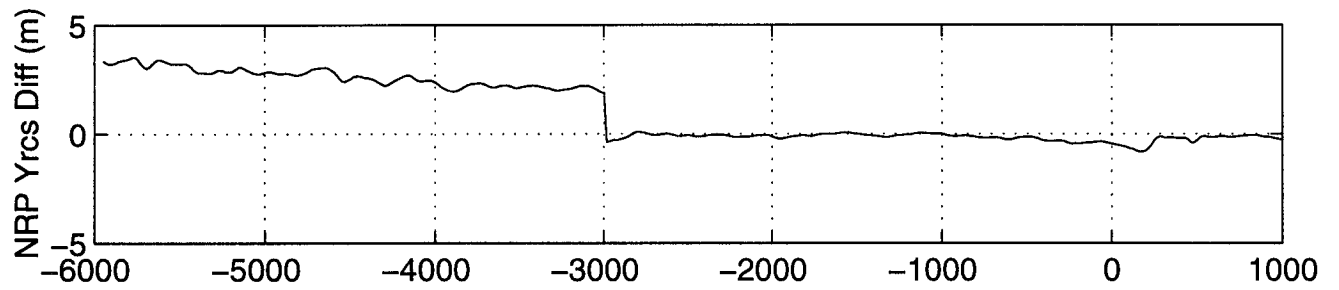
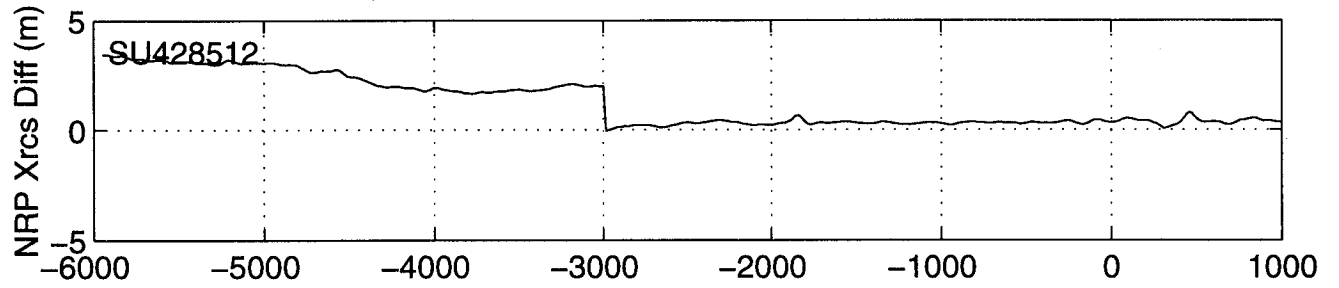
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 139.993
LGRP Yrcs POSITION (m): 3.610





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428516
START TIME: 324269.749
STOP TIME: 324378.749

APPROACH #: SU428516
START TIME: 324269.749
STOP TIME: 324378.749

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.5
MAXIMUM VDOP: 4.6
AVERAGE VDOP: 4.5

MINIMUM VDOP: 4.5
MAXIMUM VDOP: 4.6
AVERAGE VDOP: 4.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.379
NRP Yrcs MEAN DIFFERENCE (m): -0.127
NRP Zrcs MEAN DIFFERENCE (m): 0.039

NRP Xrcs MEAN DIFFERENCE (m): 0.379
NRP Yrcs MEAN DIFFERENCE (m): -0.127
NRP Zrcs MEAN DIFFERENCE (m): 0.039

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.171
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.198
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.208

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.171
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.198
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.208

NRP Xrcs 2-RMS DIFFERENCE (m): 0.777
NRP Yrcs 2-RMS DIFFERENCE (m): 0.322
NRP Zrcs 2-RMS DIFFERENCE (m): 0.222

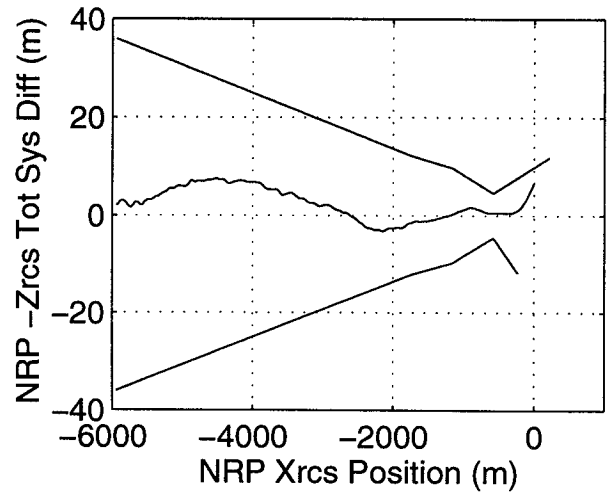
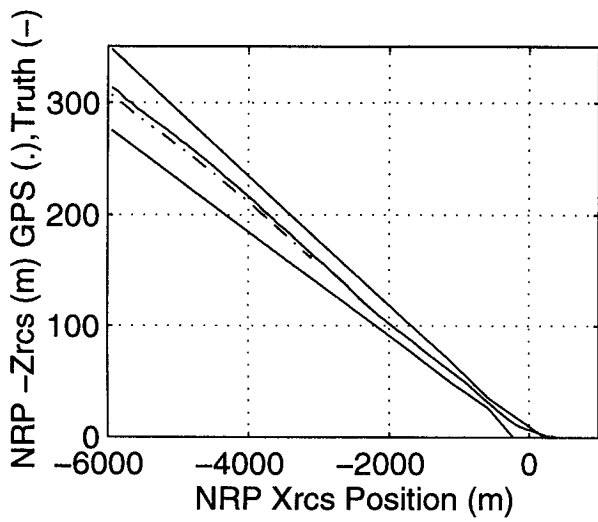
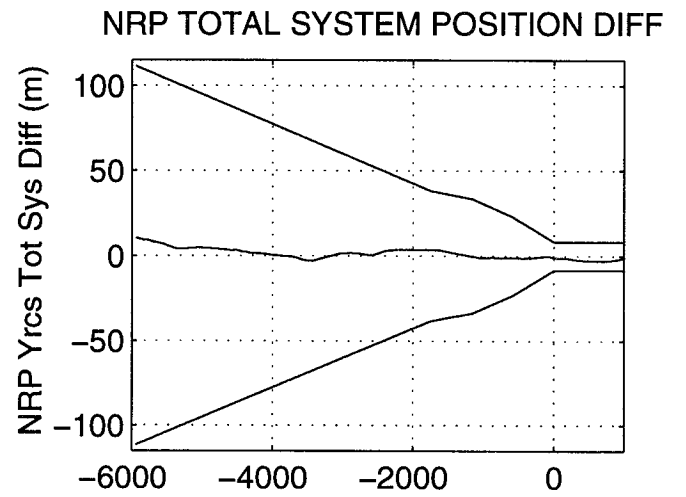
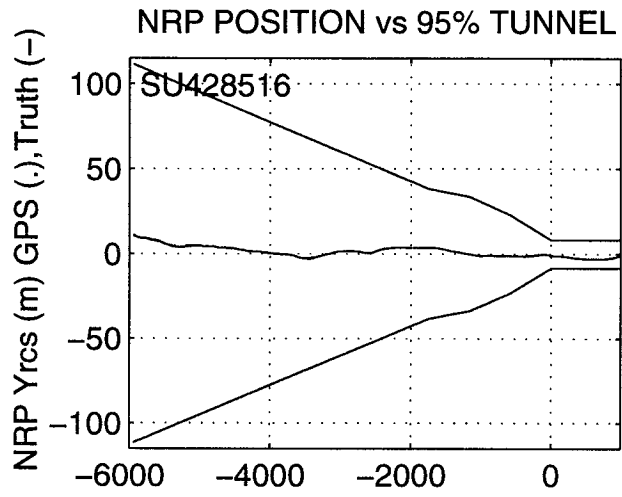
NRP Xrcs 2-RMS DIFFERENCE (m): 0.777
NRP Yrcs 2-RMS DIFFERENCE (m): 0.322
NRP Zrcs 2-RMS DIFFERENCE (m): 0.222

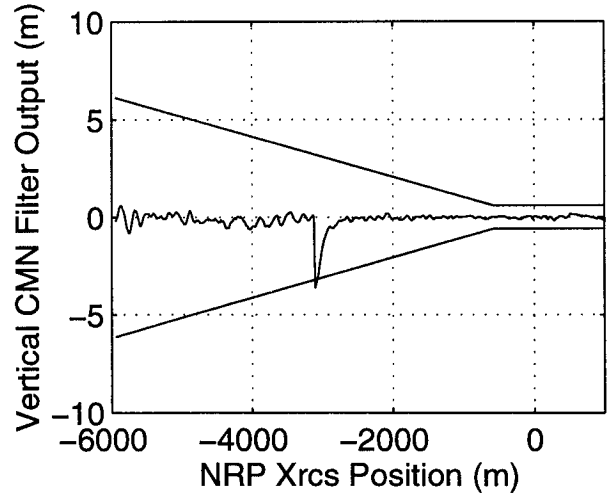
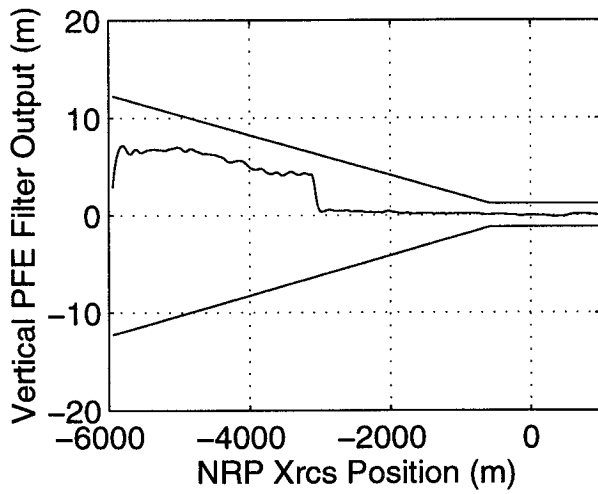
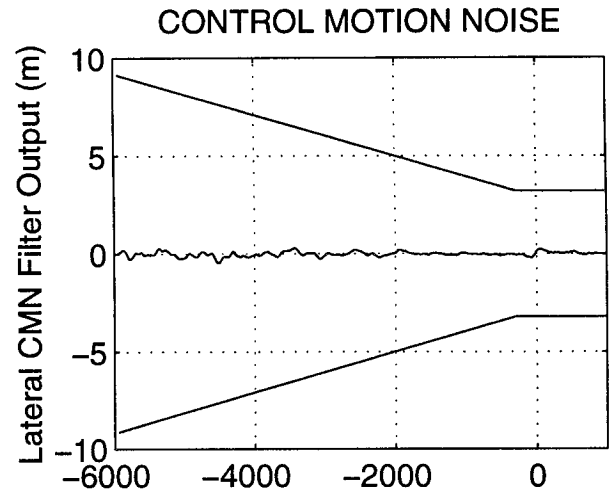
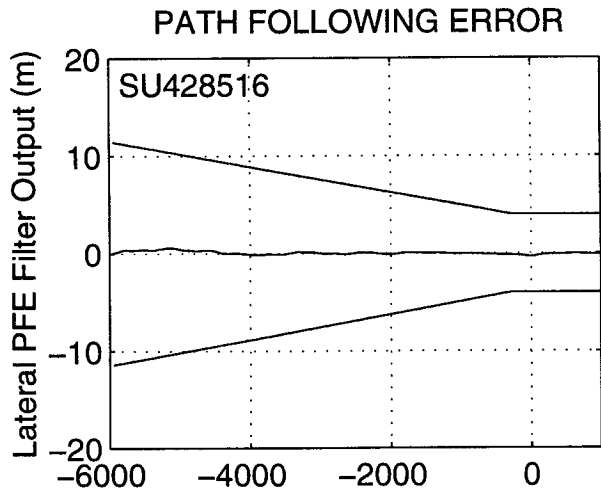
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

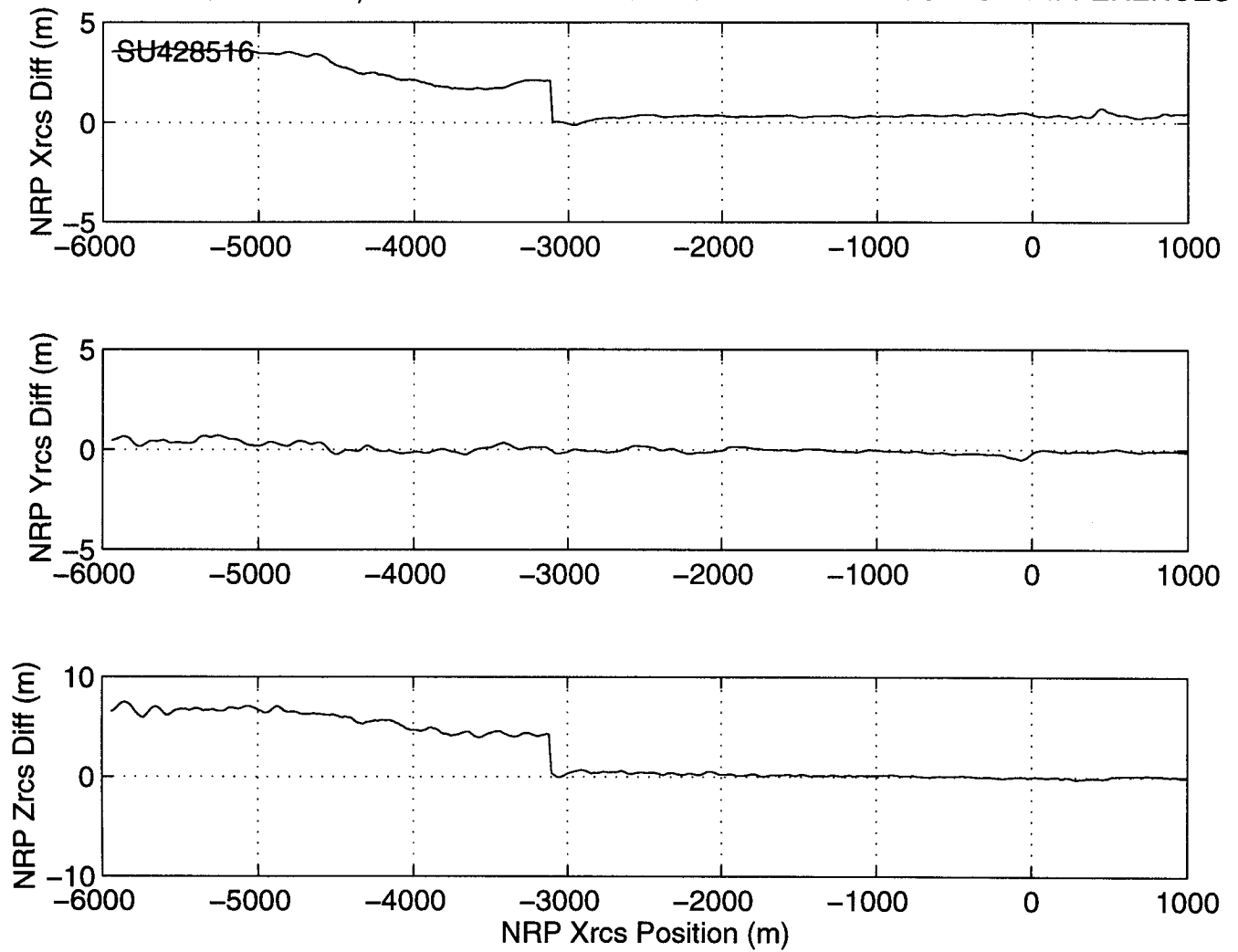
LGRP Xrcs POSITION (m): 217.611
LGRP Yrcs POSITION (m): -1.285

LGRP Xrcs POSITION (m): 217.611
LGRP Yrcs POSITION (m): -1.285





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428518
START TIME: 324661.249
STOP TIME: 324770.249

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 4.9
AVERAGE VDOP: 4.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.370
NRP Yrcs MEAN DIFFERENCE (m): -0.048
NRP Zrcs MEAN DIFFERENCE (m): 0.057

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.225
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.087
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.202

NRP Xrcs 2-RMS DIFFERENCE (m): 0.773
NRP Yrcs 2-RMS DIFFERENCE (m): 0.130
NRP Zrcs 2-RMS DIFFERENCE (m): 0.231

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 193.498
LGRP Yrcs POSITION (m): -0.409

APPROACH #: SU428518
START TIME: 324661.249
STOP TIME: 324770.249

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 4.9
AVERAGE VDOP: 4.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

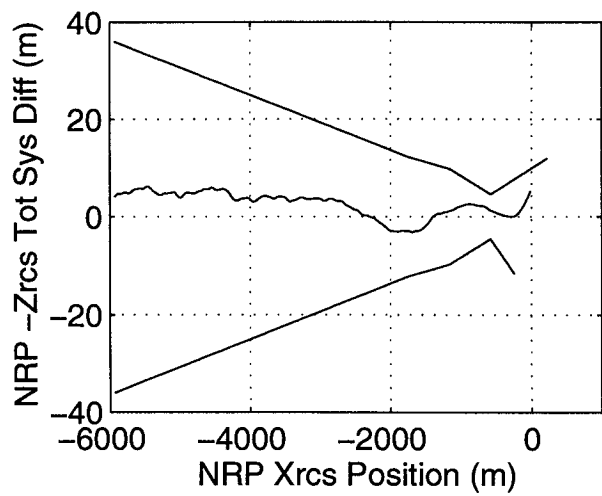
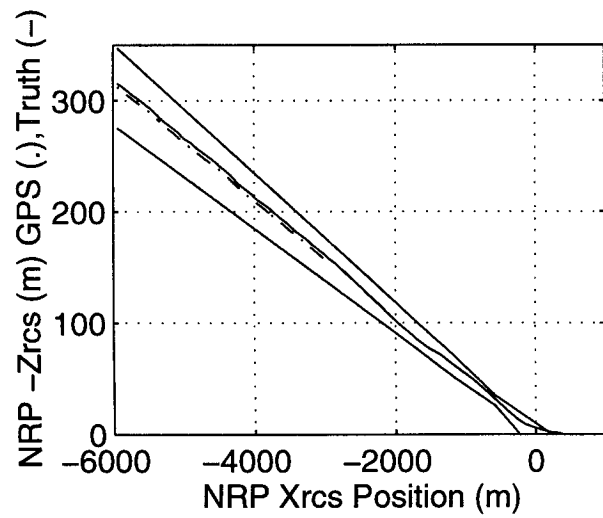
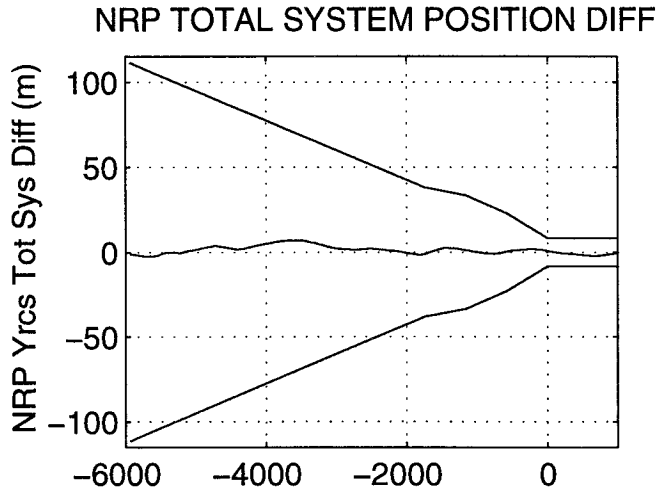
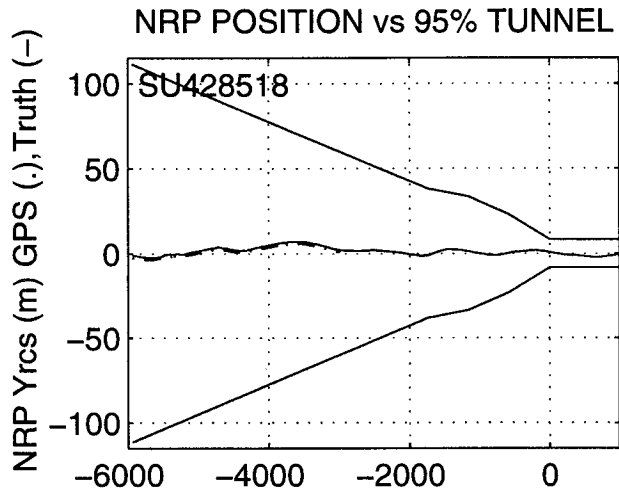
NRP Xrcs MEAN DIFFERENCE (m): 0.370
NRP Yrcs MEAN DIFFERENCE (m): -0.048
NRP Zrcs MEAN DIFFERENCE (m): 0.057

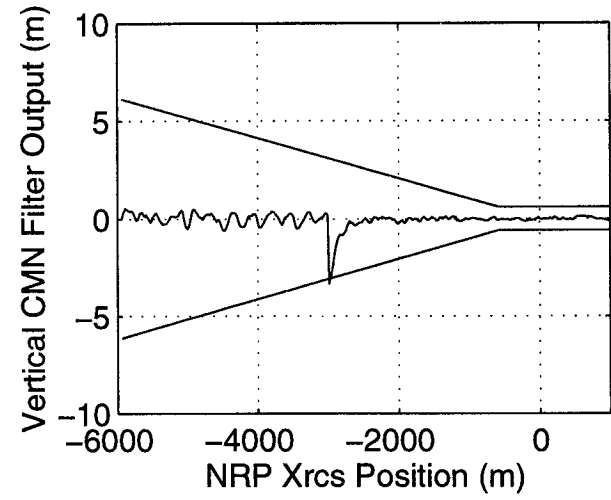
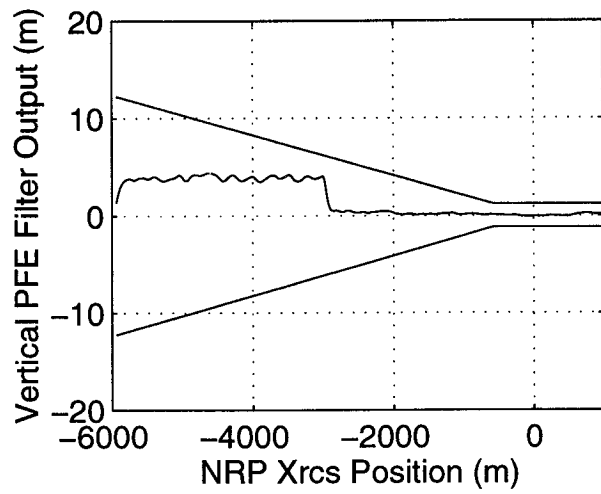
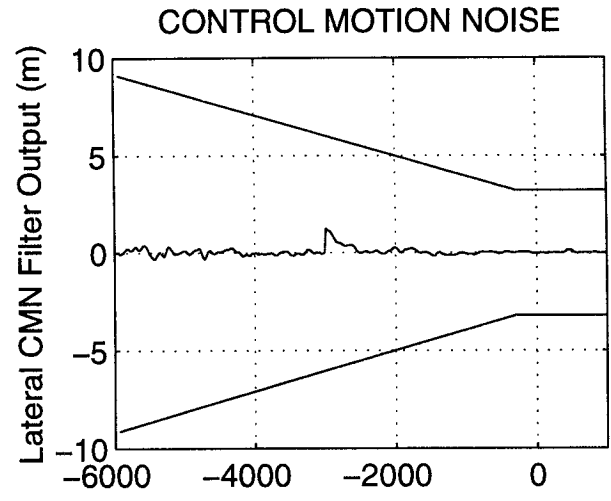
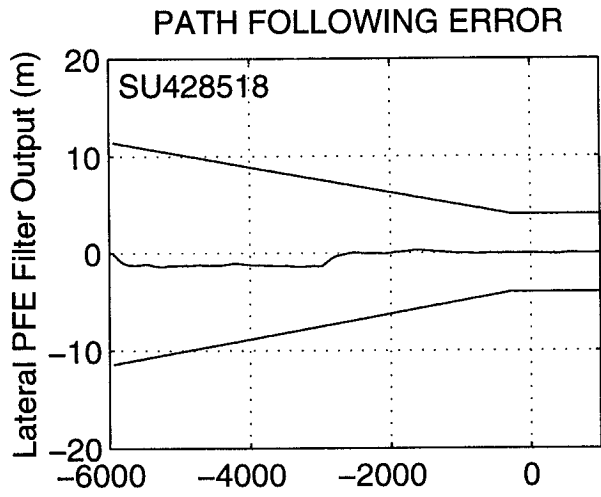
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.225
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.087
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.202

NRP Xrcs 2-RMS DIFFERENCE (m): 0.773
NRP Yrcs 2-RMS DIFFERENCE (m): 0.130
NRP Zrcs 2-RMS DIFFERENCE (m): 0.231

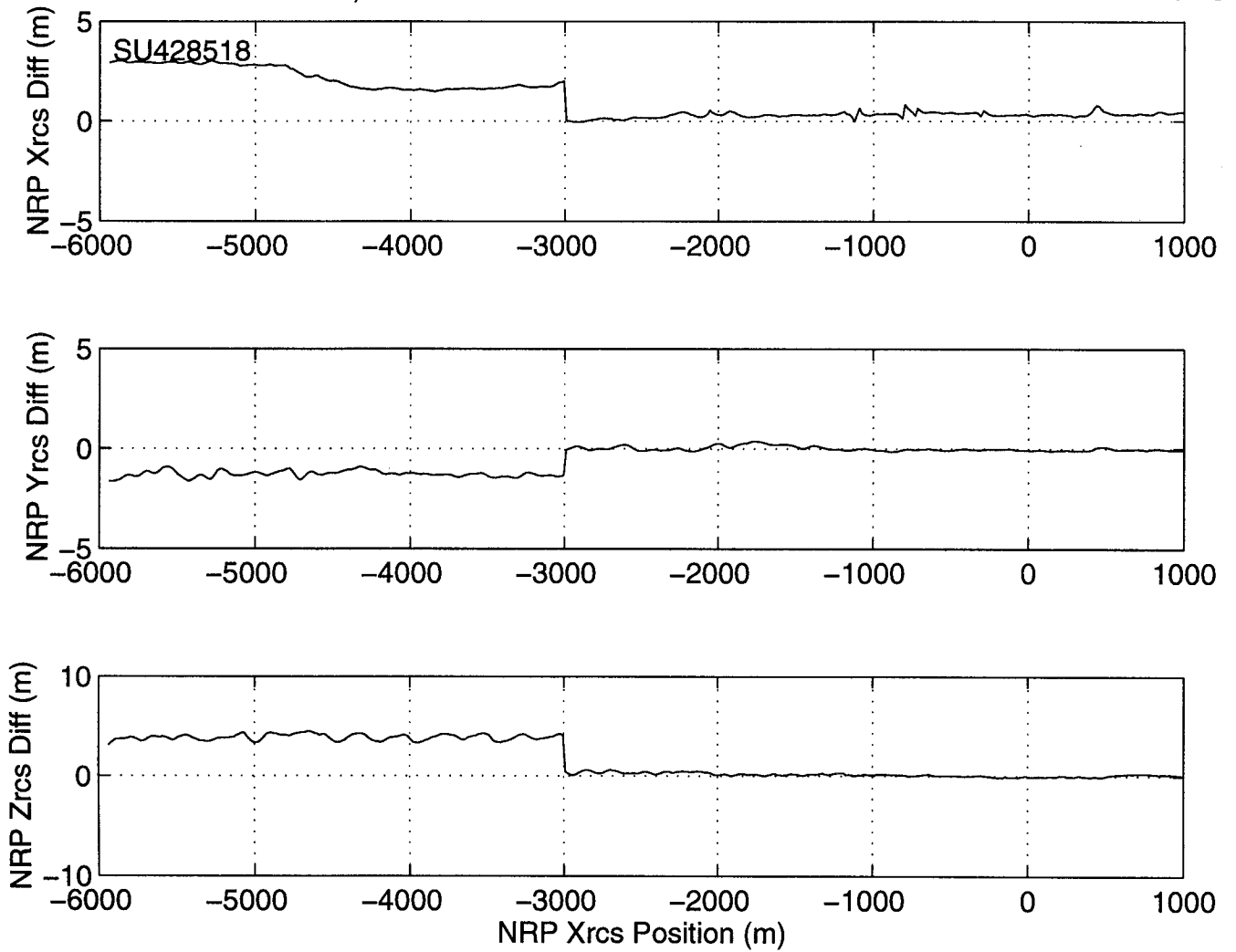
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 193.498
LGRP Yrcs POSITION (m): -0.409





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428520
START TIME: 325118.749
STOP TIME: 325227.749

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.2
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.365
NRP Yrcs MEAN DIFFERENCE (m): -0.037
NRP Zrcs MEAN DIFFERENCE (m): -0.032

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.313
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.224
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.207

NRP Xrcs 2-RMS DIFFERENCE (m): 0.795
NRP Yrcs 2-RMS DIFFERENCE (m): 0.236
NRP Zrcs 2-RMS DIFFERENCE (m): 0.216

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 242.966
LGRP Yrcs POSITION (m): 2.444

APPROACH #: SU428520
START TIME: 325118.749
STOP TIME: 325227.749

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.2
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

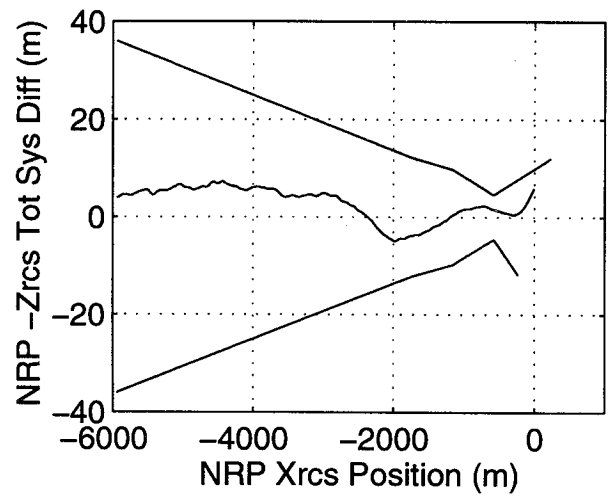
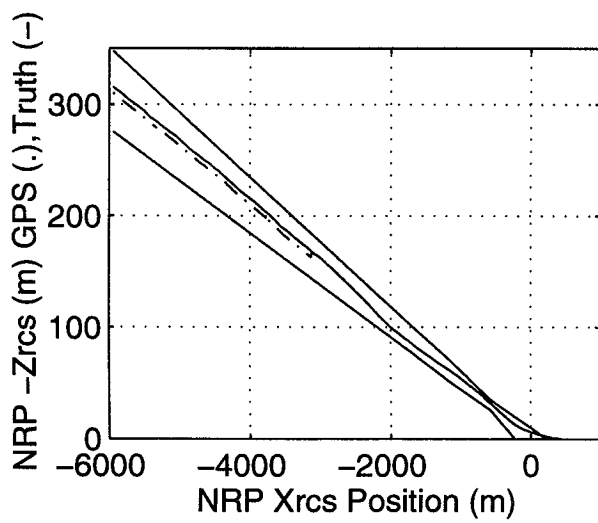
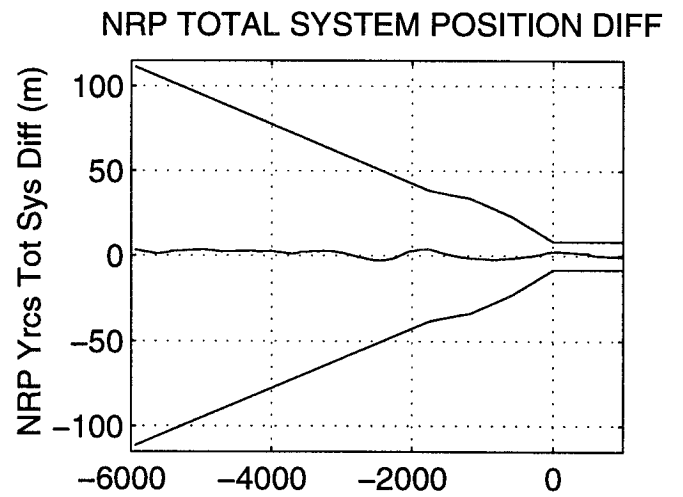
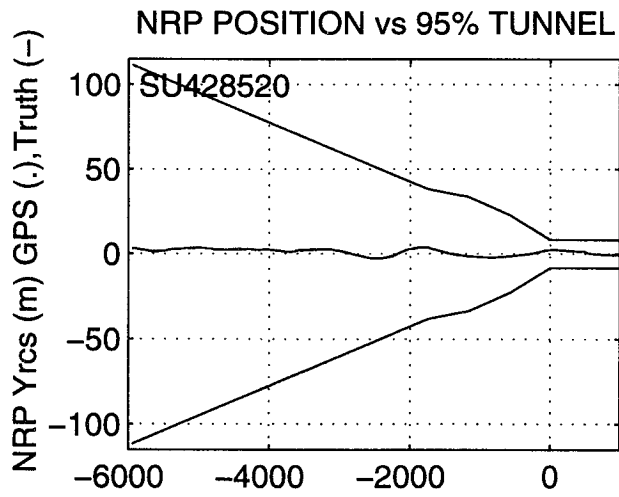
NRP Xrcs MEAN DIFFERENCE (m): 0.365
NRP Yrcs MEAN DIFFERENCE (m): -0.037
NRP Zrcs MEAN DIFFERENCE (m): -0.032

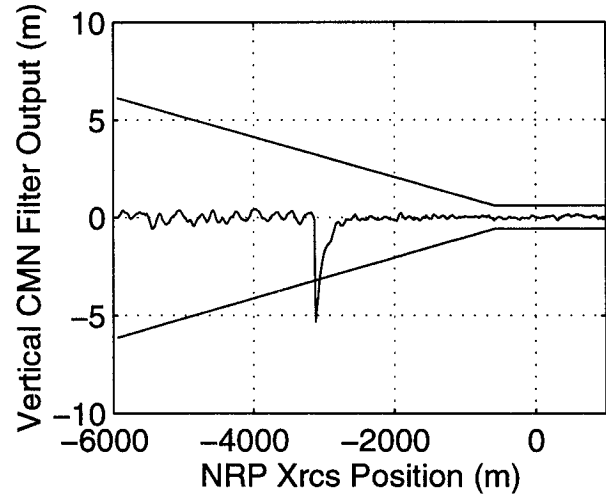
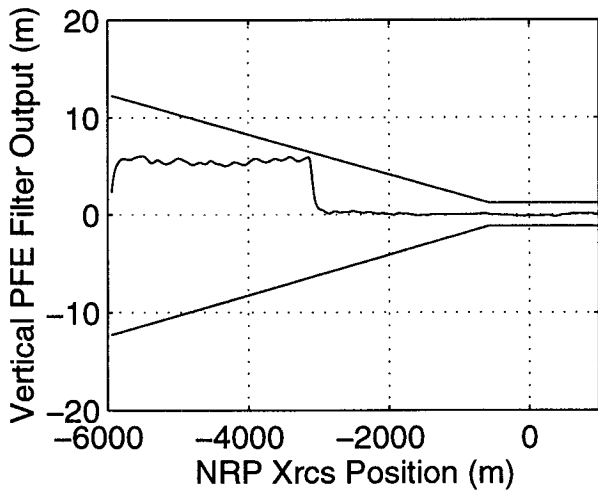
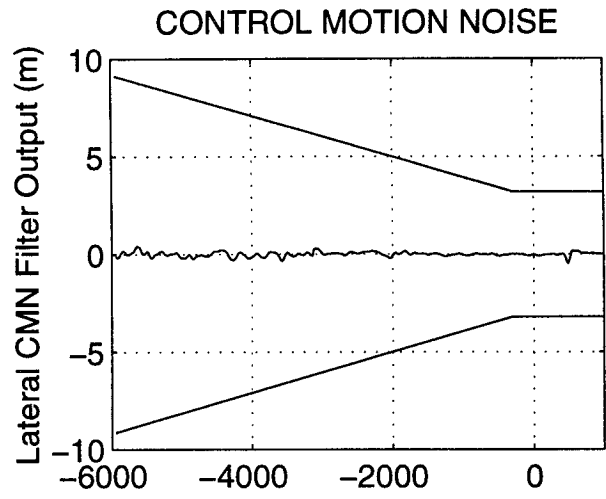
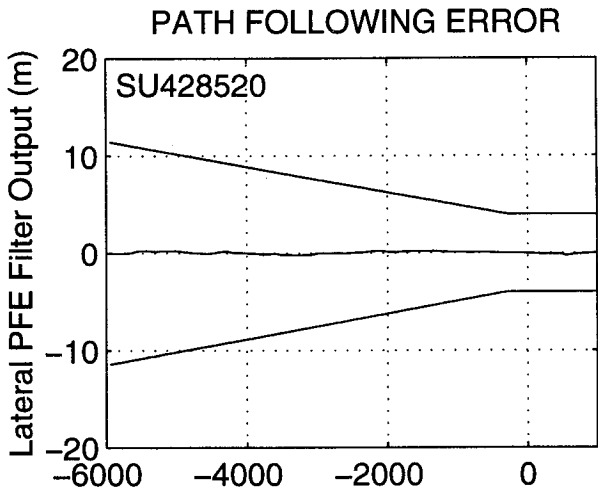
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.313
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.224
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.207

NRP Xrcs 2-RMS DIFFERENCE (m): 0.795
NRP Yrcs 2-RMS DIFFERENCE (m): 0.236
NRP Zrcs 2-RMS DIFFERENCE (m): 0.216

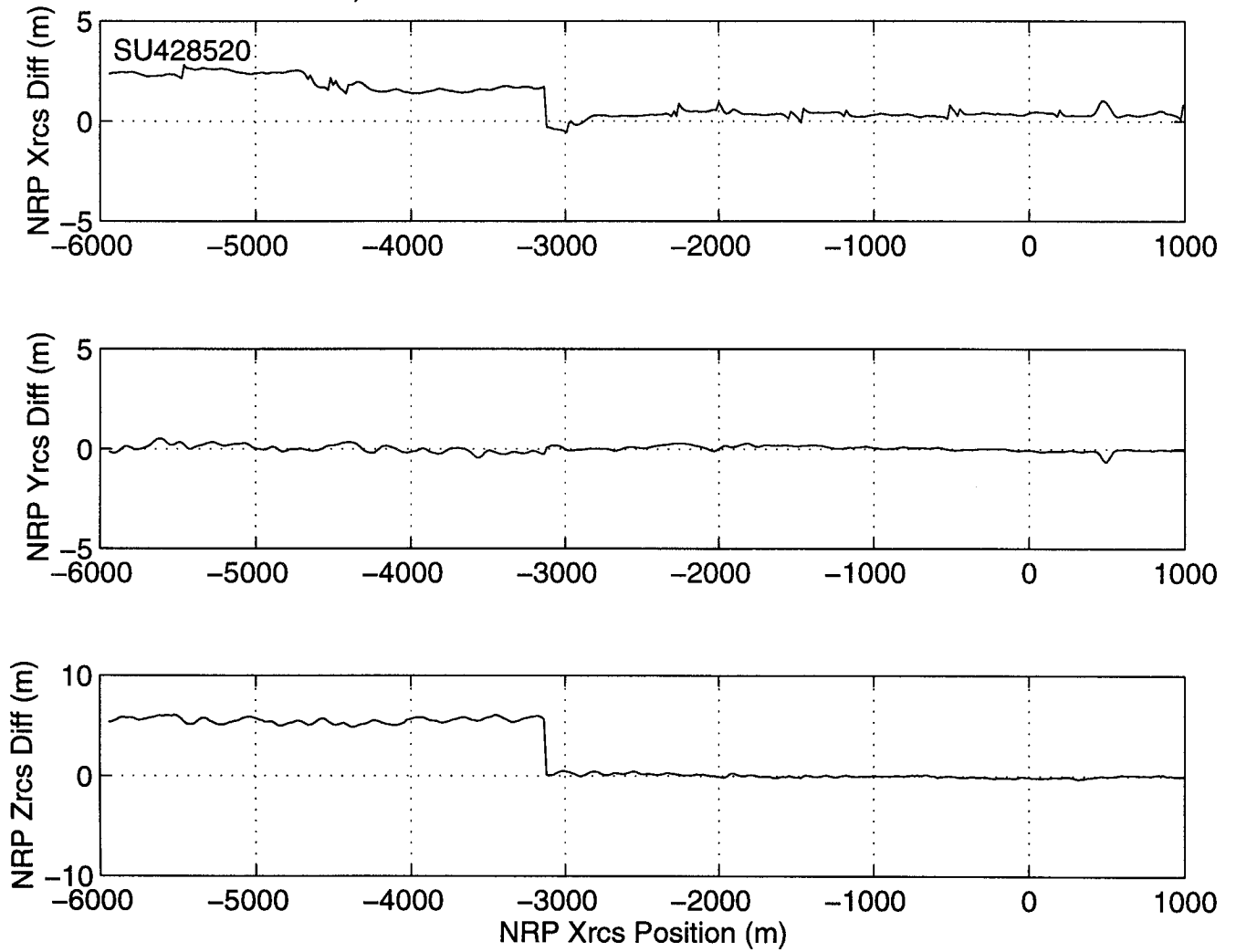
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 242.966
LGRP Yrcs POSITION (m): 2.444





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428522
START TIME: 325549.749
STOP TIME: 325659.499

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.9
MAXIMUM VDOP: 6.1
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.422
NRP Yrcs MEAN DIFFERENCE (m): -0.091
NRP Zrcs MEAN DIFFERENCE (m): -0.063

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.532
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.132
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.228

NRP Xrcs 2-RMS DIFFERENCE (m): 0.998
NRP Yrcs 2-RMS DIFFERENCE (m): 0.224
NRP Zrcs 2-RMS DIFFERENCE (m): 0.261

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 202.492
LGRP Yrcs POSITION (m): 0.056

APPROACH #: SU428522
START TIME: 325549.749
STOP TIME: 325659.499

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.9
MAXIMUM VDOP: 6.1
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

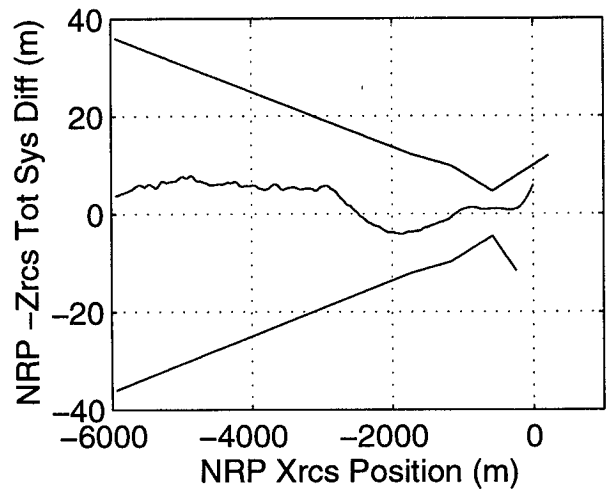
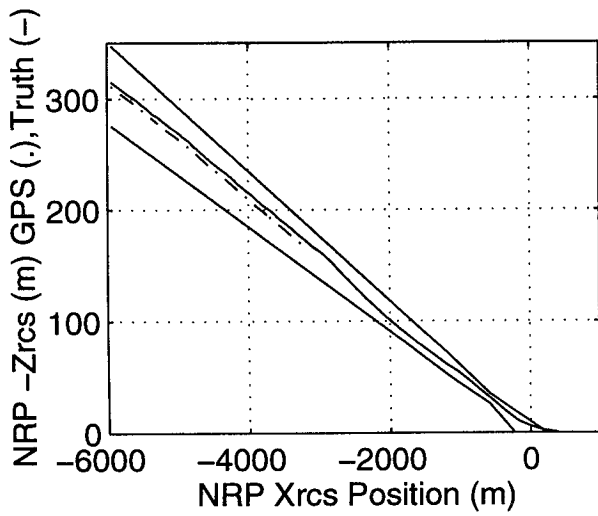
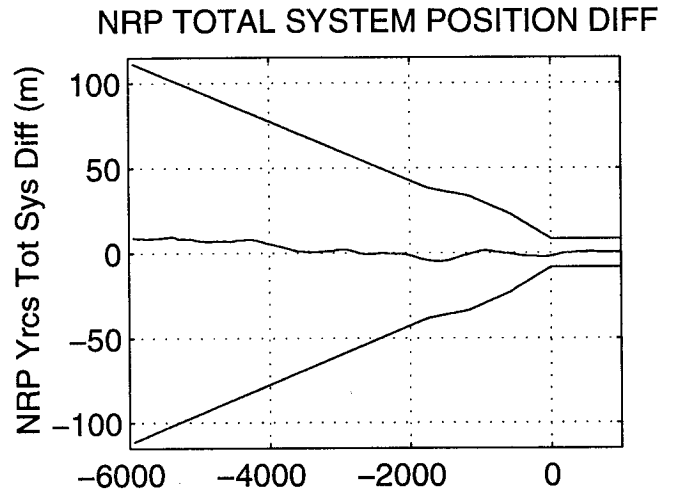
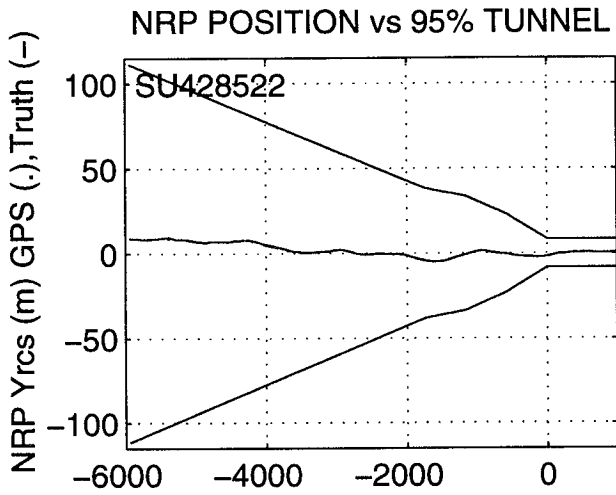
NRP Xrcs MEAN DIFFERENCE (m): 0.422
NRP Yrcs MEAN DIFFERENCE (m): -0.091
NRP Zrcs MEAN DIFFERENCE (m): -0.063

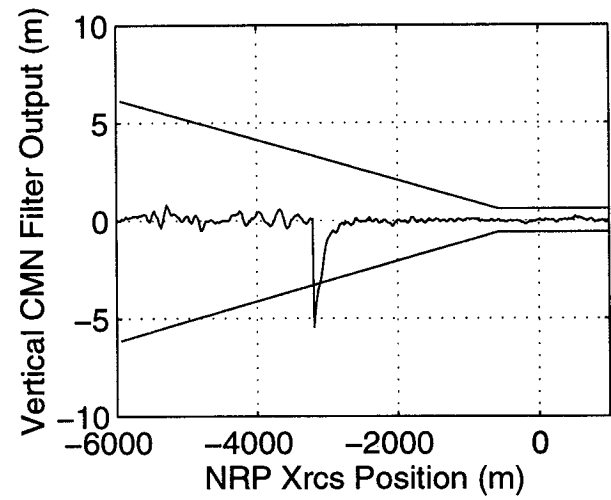
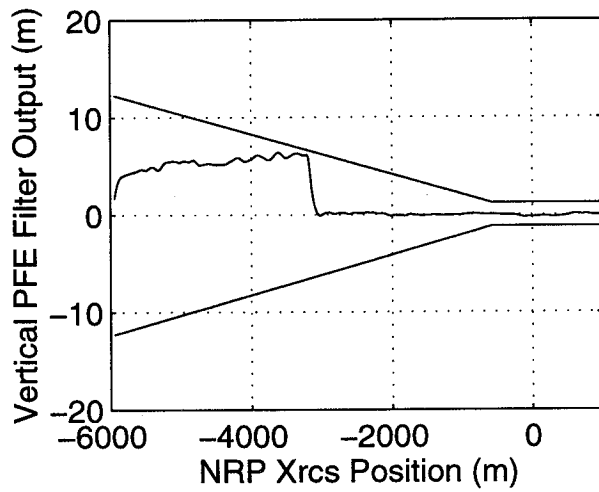
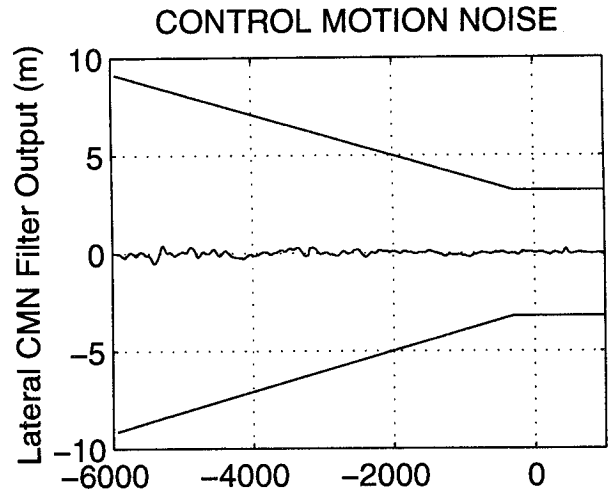
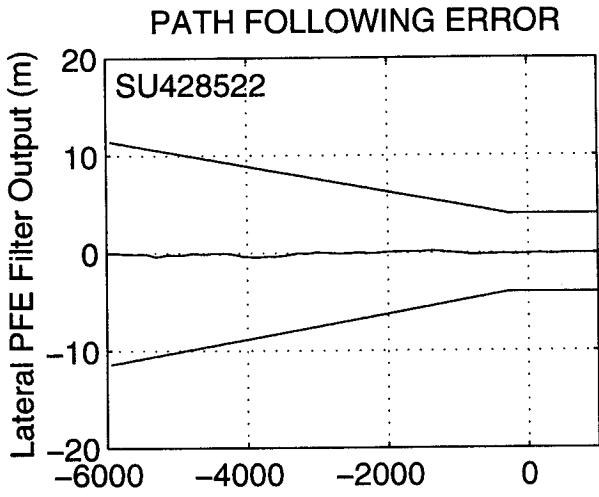
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.532
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.132
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.228

NRP Xrcs 2-RMS DIFFERENCE (m): 0.998
NRP Yrcs 2-RMS DIFFERENCE (m): 0.224
NRP Zrcs 2-RMS DIFFERENCE (m): 0.261

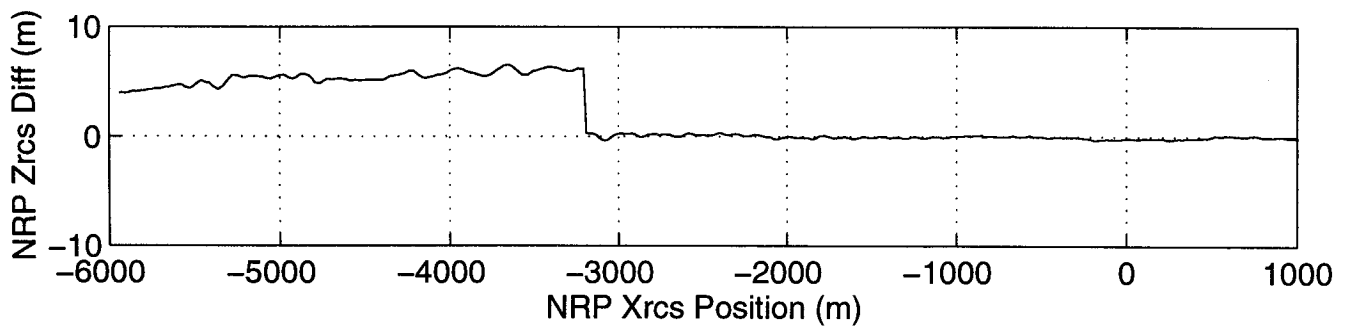
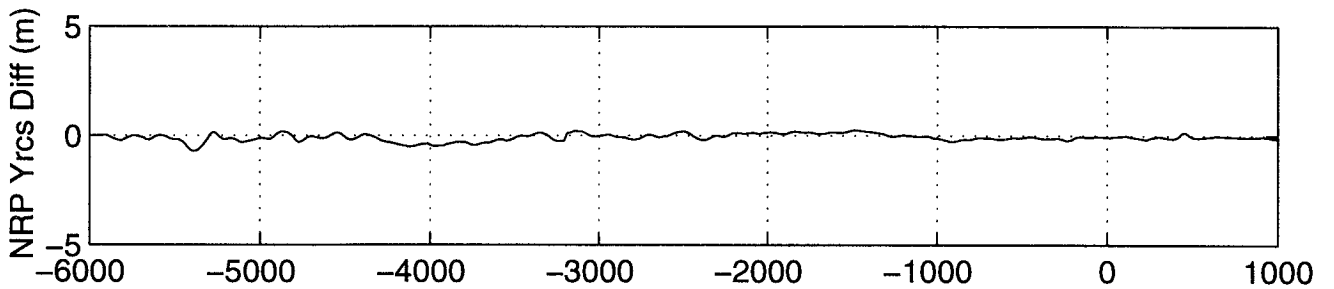
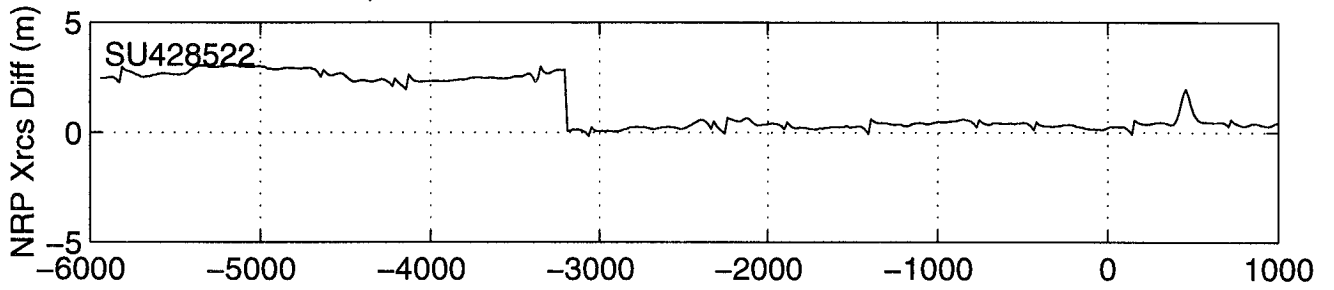
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 202.492
LGRP Yrcs POSITION (m): 0.056





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428524
START TIME: 325972.999
STOP TIME: 326087.749

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.388
NRP Yrcs MEAN DIFFERENCE (m): -0.056
NRP Zrcs MEAN DIFFERENCE (m): 0.015

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.299
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.173
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.234

NRP Xrcs 2-RMS DIFFERENCE (m): 0.831
NRP Yrcs 2-RMS DIFFERENCE (m): 0.206
NRP Zrcs 2-RMS DIFFERENCE (m): 0.236

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 234.433
LGRP Yrcs POSITION (m): 2.021

APPROACH #: SU428524
START TIME: 325972.999
STOP TIME: 326087.749

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

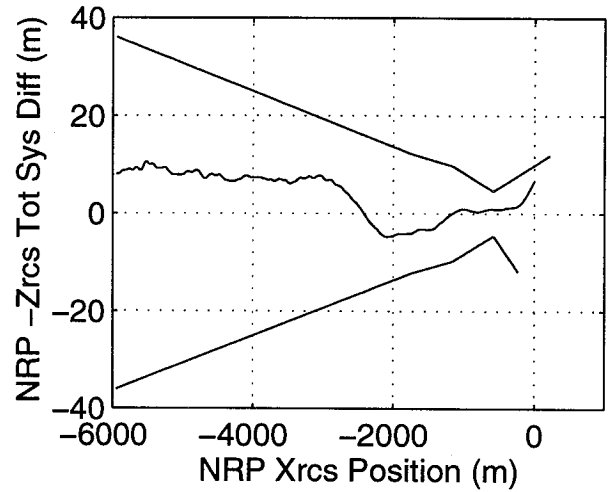
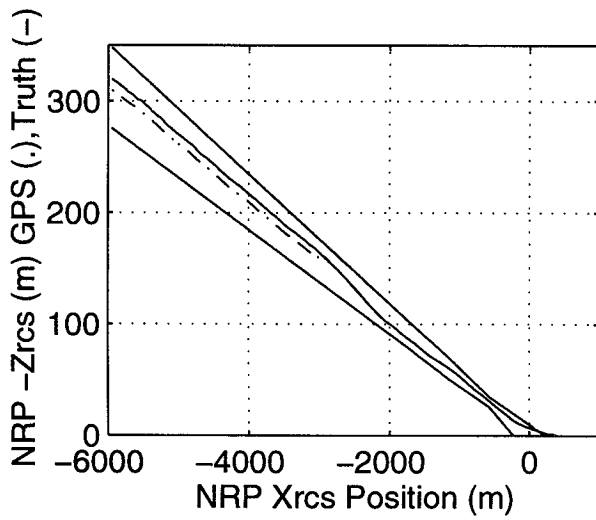
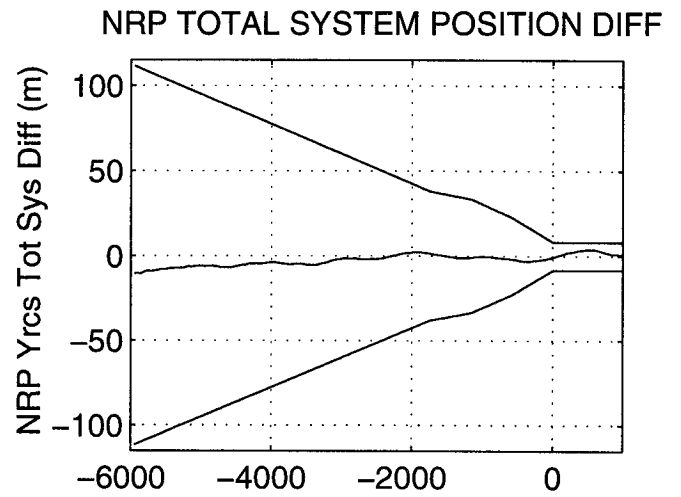
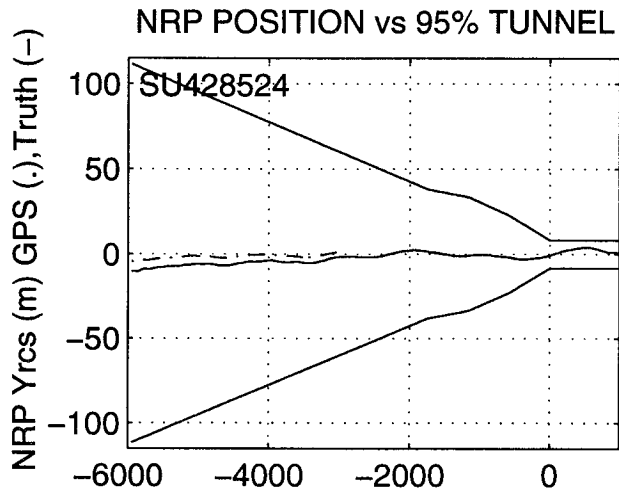
NRP Xrcs MEAN DIFFERENCE (m): 0.388
NRP Yrcs MEAN DIFFERENCE (m): -0.056
NRP Zrcs MEAN DIFFERENCE (m): 0.015

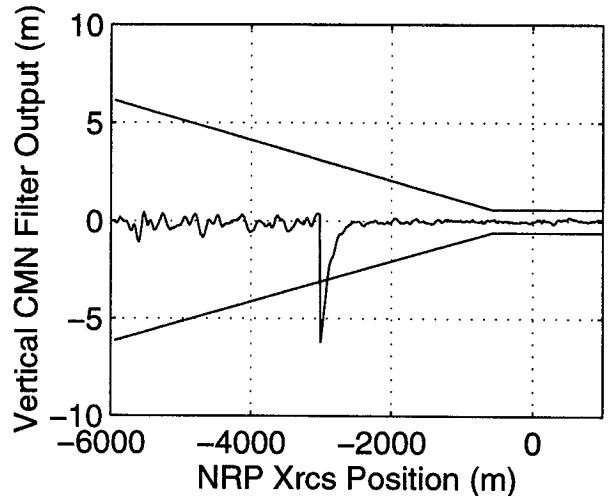
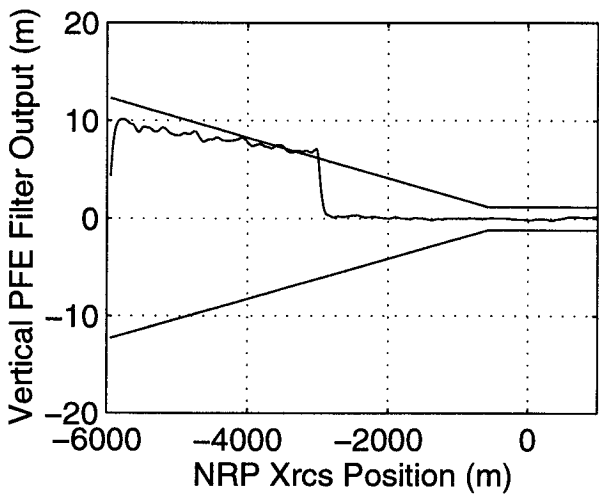
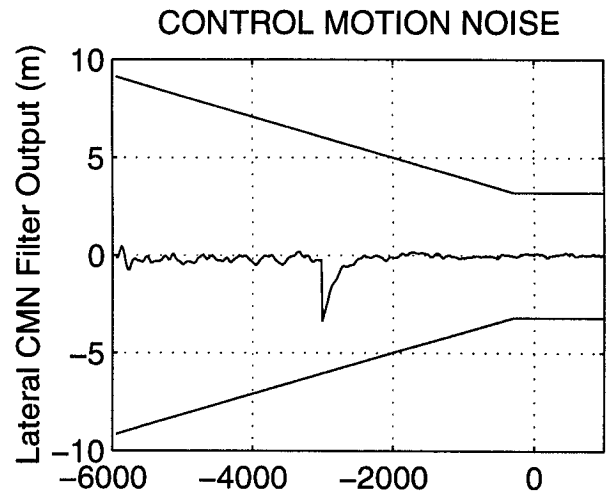
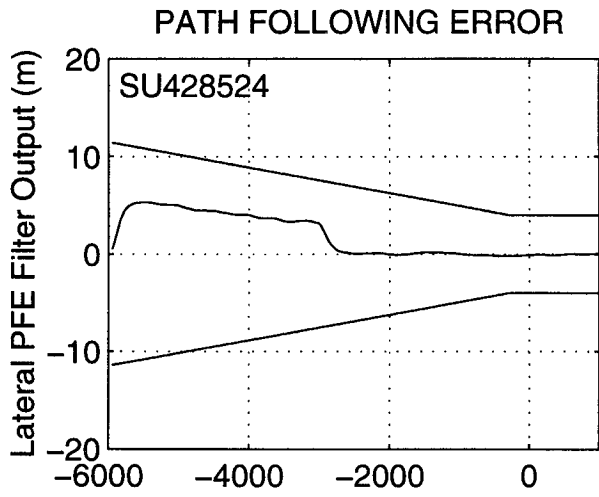
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.299
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.173
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.234

NRP Xrcs 2-RMS DIFFERENCE (m): 0.831
NRP Yrcs 2-RMS DIFFERENCE (m): 0.206
NRP Zrcs 2-RMS DIFFERENCE (m): 0.236

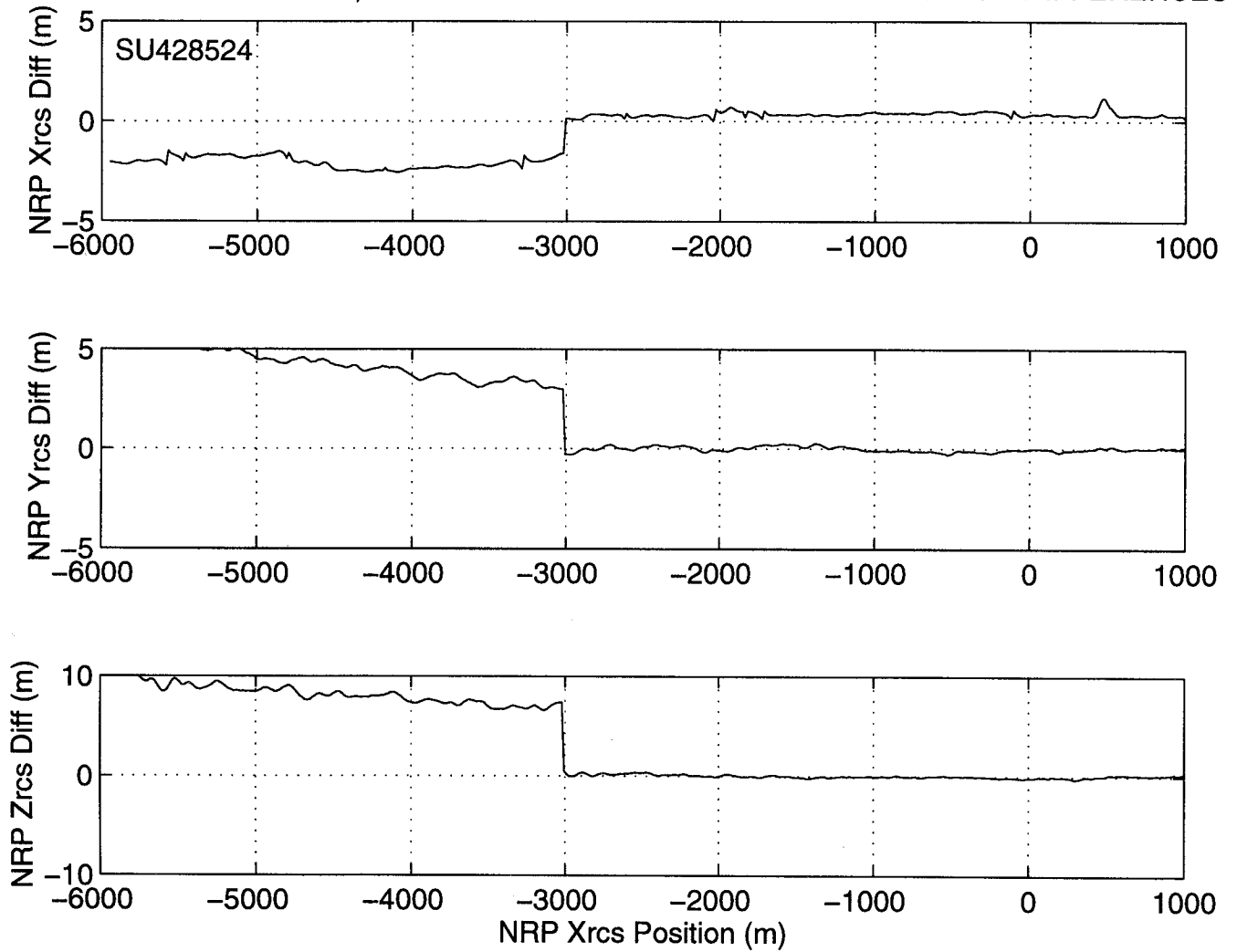
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 234.433
LGRP Yrcs POSITION (m): 2.021





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428526
START TIME: 326676.999
STOP TIME: 326784.499

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.2
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.467
NRP Yrcs MEAN DIFFERENCE (m): -0.131
NRP Zrcs MEAN DIFFERENCE (m): 0.055

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.193
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.159
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.200

NRP Xrcs 2-RMS DIFFERENCE (m): 0.953
NRP Yrcs 2-RMS DIFFERENCE (m): 0.306
NRP Zrcs 2-RMS DIFFERENCE (m): 0.229

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 228.619
LGRP Yrcs POSITION (m): 3.873

APPROACH #: SU428526
START TIME: 326676.999
STOP TIME: 326784.499

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.2
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

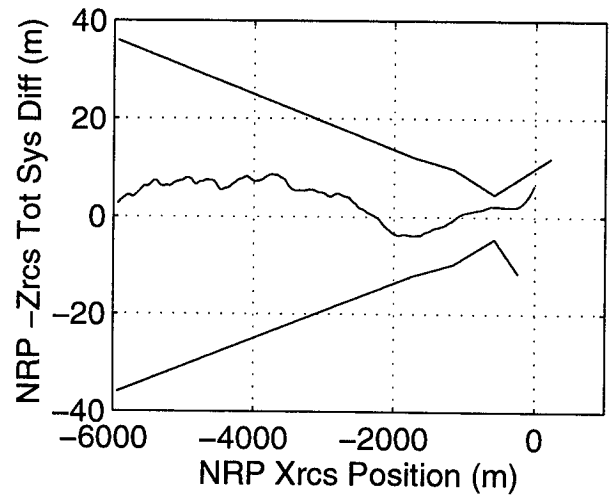
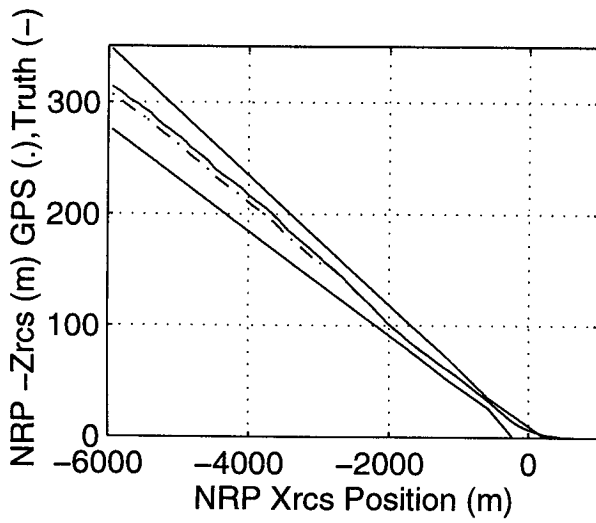
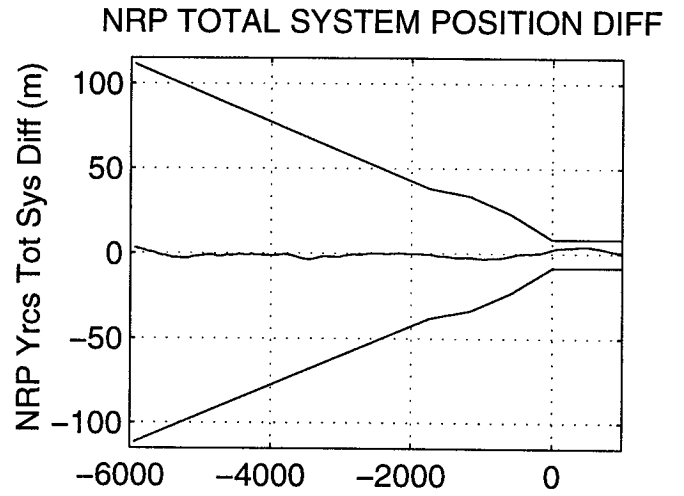
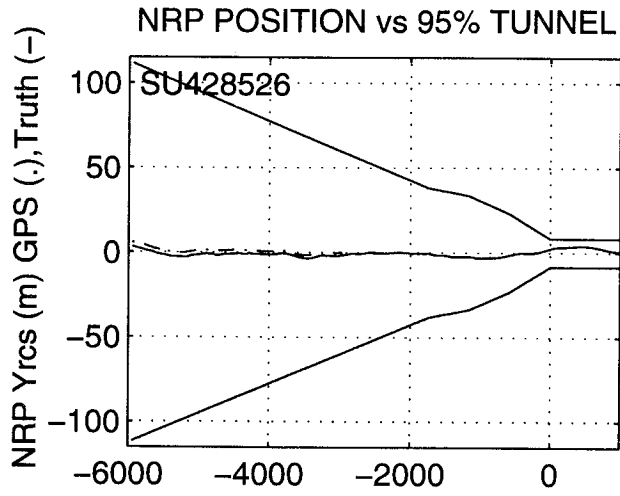
NRP Xrcs MEAN DIFFERENCE (m): 0.467
NRP Yrcs MEAN DIFFERENCE (m): -0.131
NRP Zrcs MEAN DIFFERENCE (m): 0.055

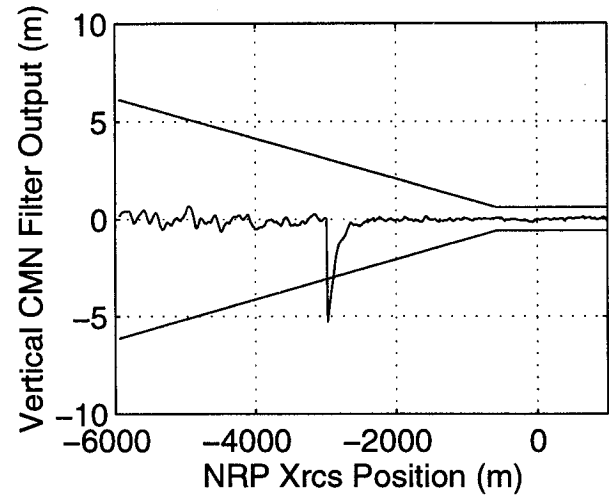
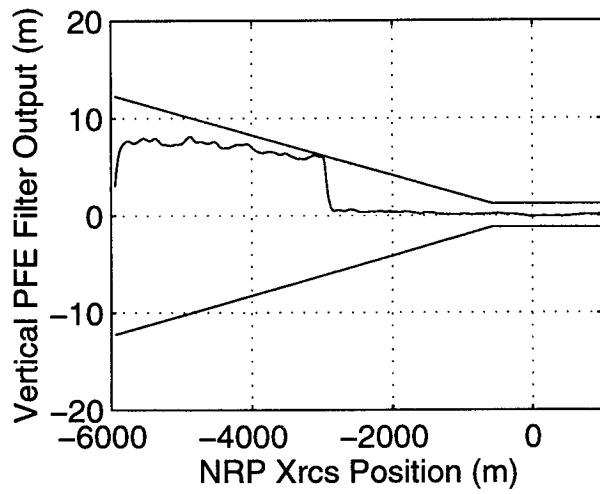
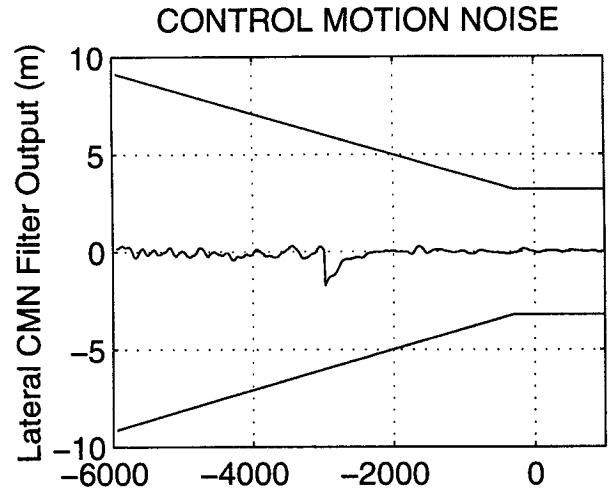
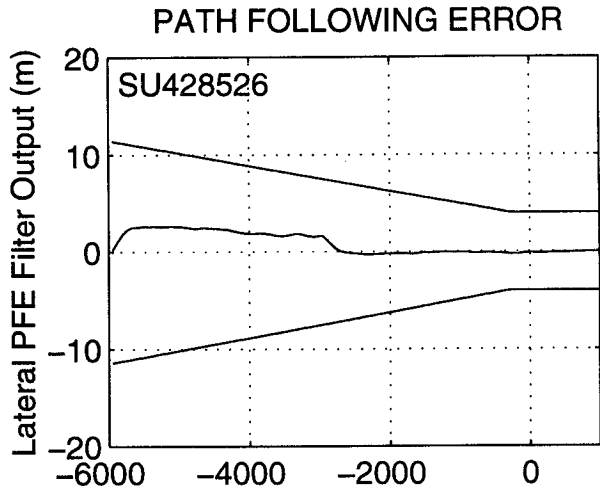
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.193
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.159
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.200

NRP Xrcs 2-RMS DIFFERENCE (m): 0.953
NRP Yrcs 2-RMS DIFFERENCE (m): 0.306
NRP Zrcs 2-RMS DIFFERENCE (m): 0.229

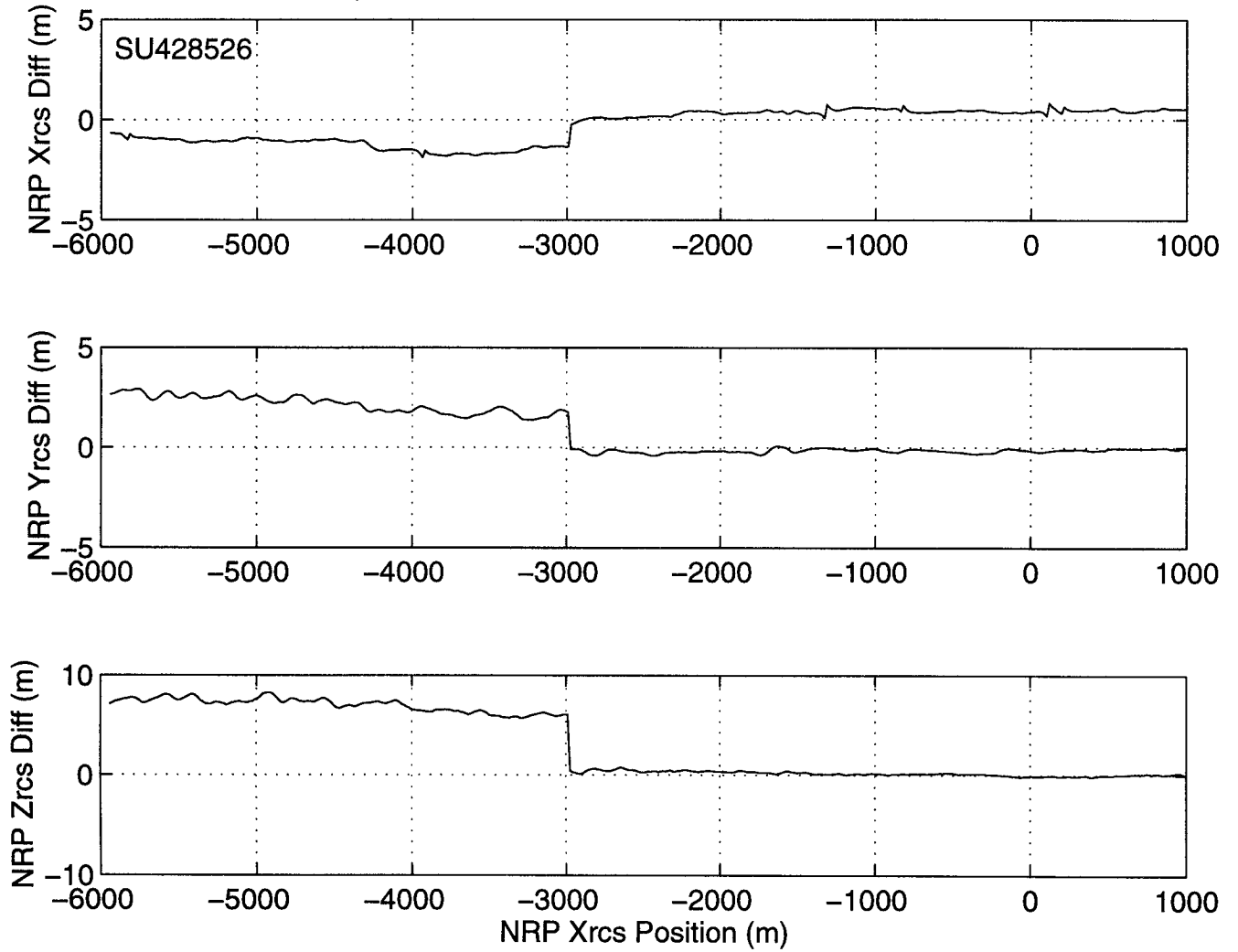
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 228.619
LGRP Yrcs POSITION (m): 3.873





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428528
START TIME: 327121.499
STOP TIME: 327229.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.452
NRP Yrcs MEAN DIFFERENCE (m): -0.113
NRP Zrcs MEAN DIFFERENCE (m): 0.045

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.259
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.161
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.261

NRP Xrcs 2-RMS DIFFERENCE (m): 0.939
NRP Yrcs 2-RMS DIFFERENCE (m): 0.277
NRP Zrcs 2-RMS DIFFERENCE (m): 0.276

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 159.472
LGRP Yrcs POSITION (m): 0.436

APPROACH #: SU428528
START TIME: 327121.499
STOP TIME: 327229.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

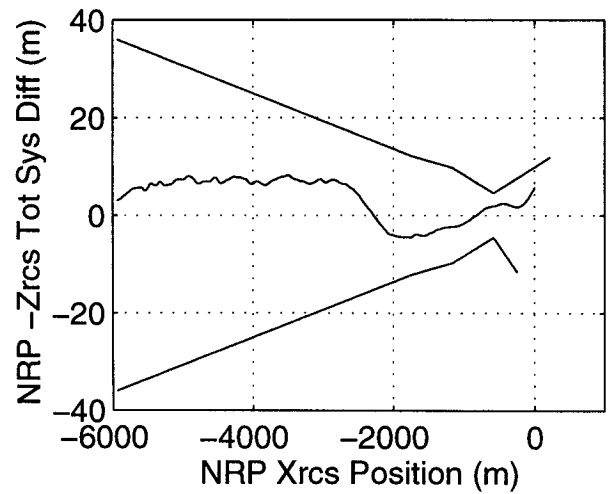
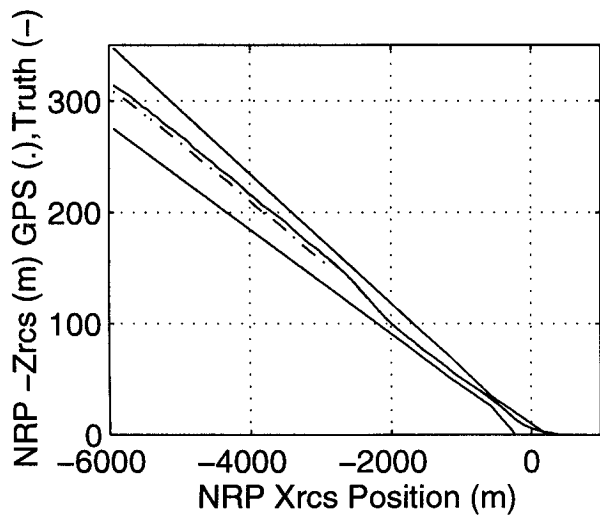
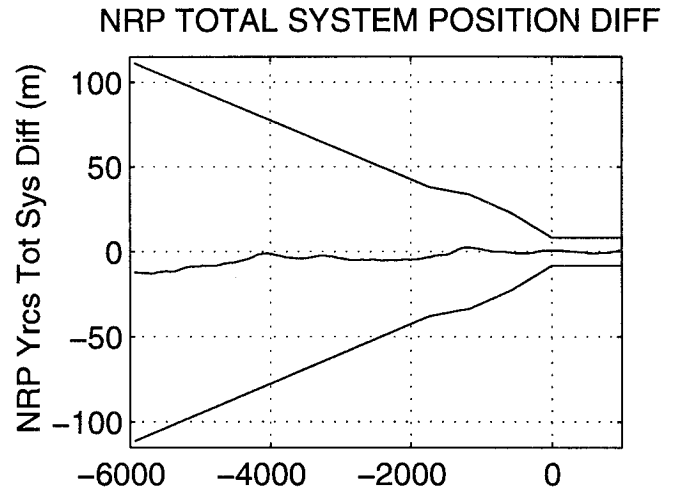
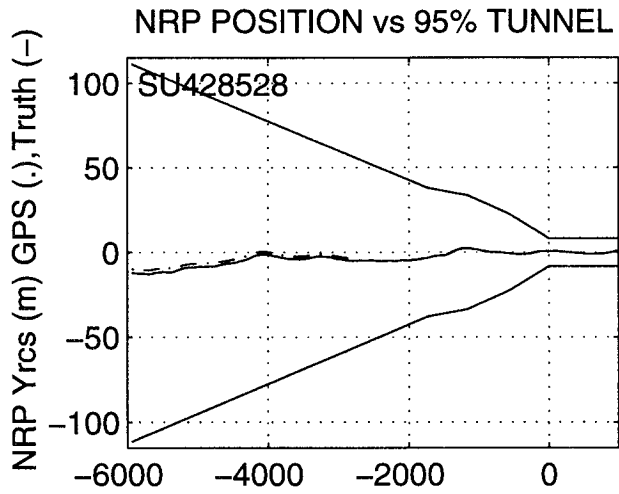
NRP Xrcs MEAN DIFFERENCE (m): 0.452
NRP Yrcs MEAN DIFFERENCE (m): -0.113
NRP Zrcs MEAN DIFFERENCE (m): 0.045

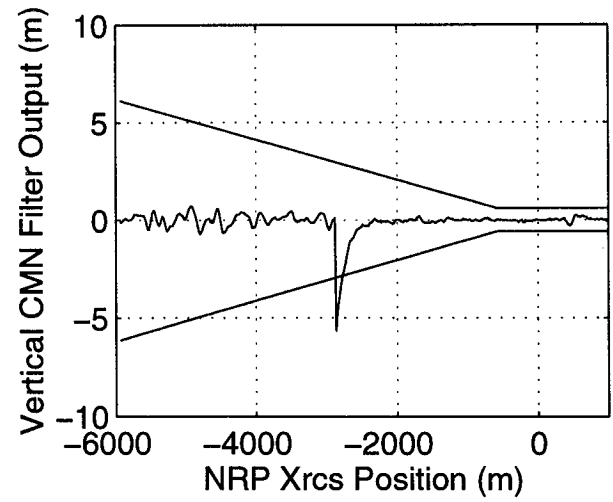
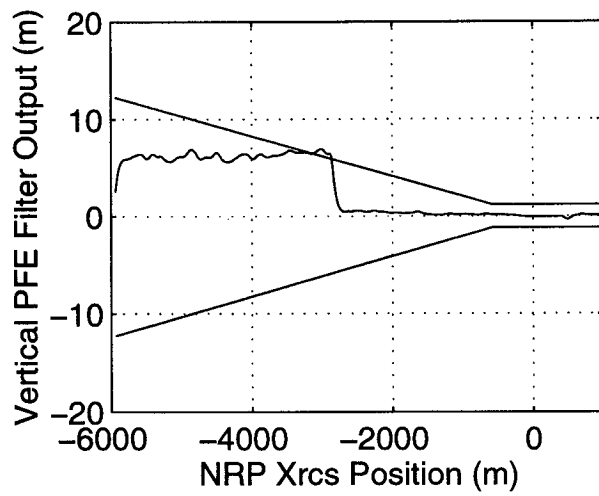
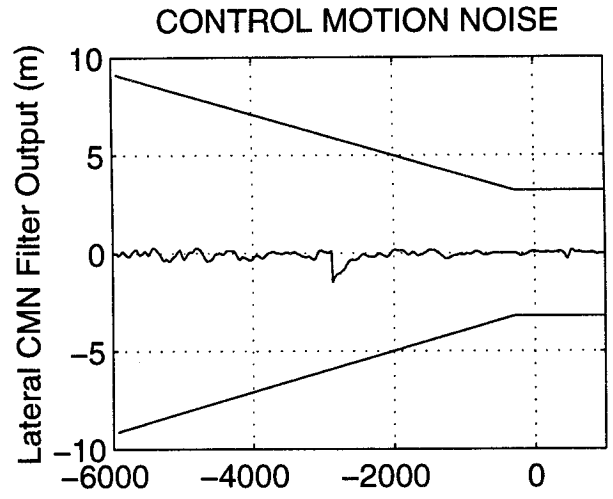
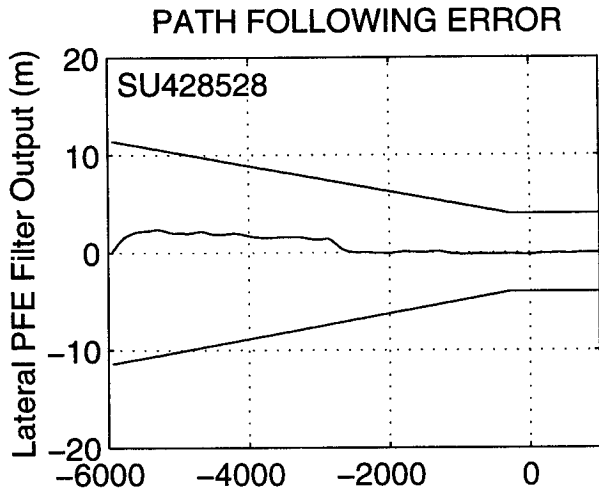
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.259
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.161
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.261

NRP Xrcs 2-RMS DIFFERENCE (m): 0.939
NRP Yrcs 2-RMS DIFFERENCE (m): 0.277
NRP Zrcs 2-RMS DIFFERENCE (m): 0.276

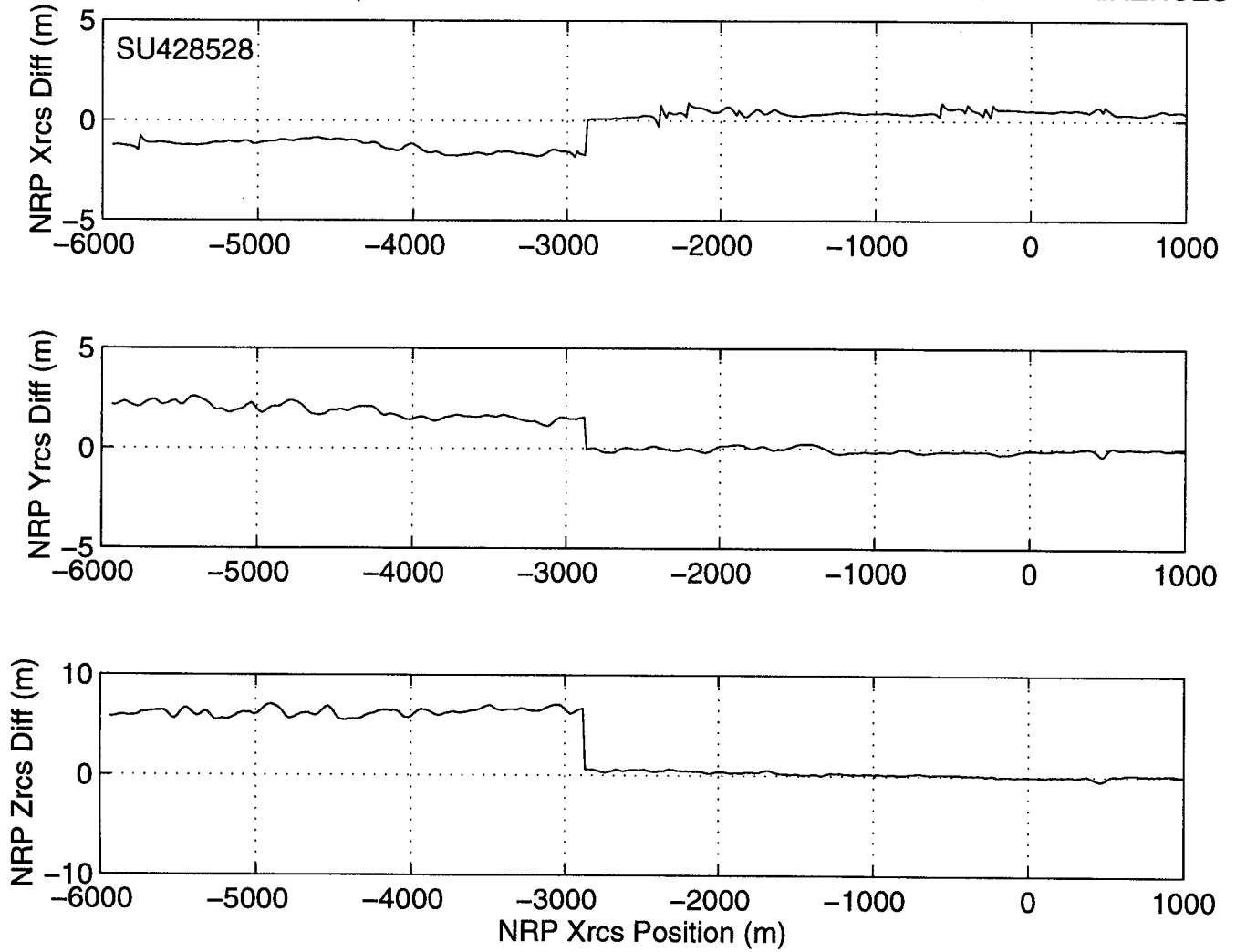
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 159.472
LGRP Yrcs POSITION (m): 0.436





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428530
START TIME: 327545.499
STOP TIME: 327653.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.470
NRP Yrcs MEAN DIFFERENCE (m): -0.065
NRP Zrcs MEAN DIFFERENCE (m): 0.007

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.263
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.126
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.180

NRP Xrcs 2-RMS DIFFERENCE (m): 0.976
NRP Yrcs 2-RMS DIFFERENCE (m): 0.180
NRP Zrcs 2-RMS DIFFERENCE (m): 0.181

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 163.649
LGRP Yrcs POSITION (m): -1.566

APPROACH #: SU428530
START TIME: 327545.499
STOP TIME: 327653.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

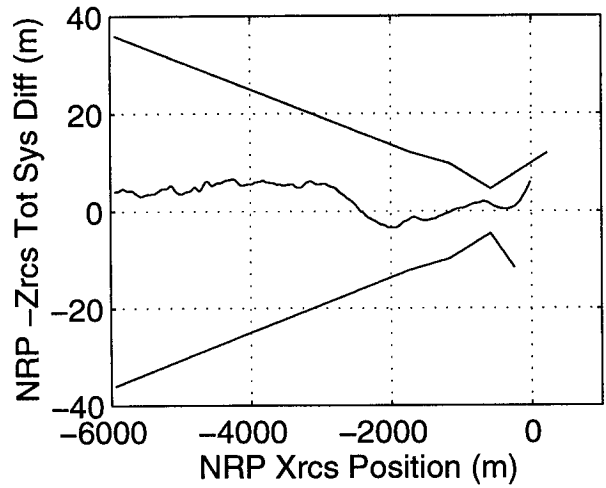
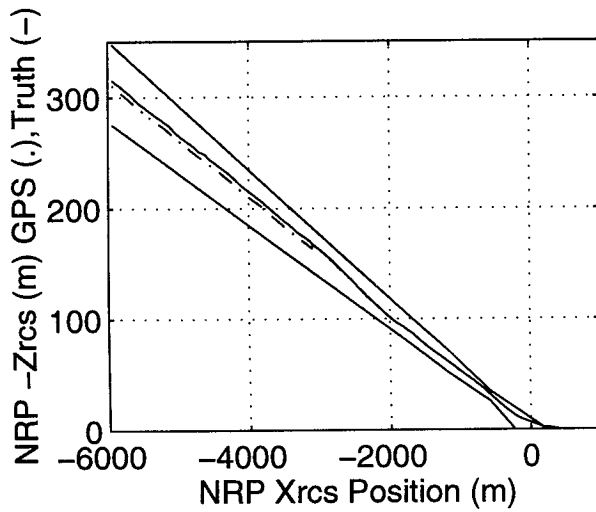
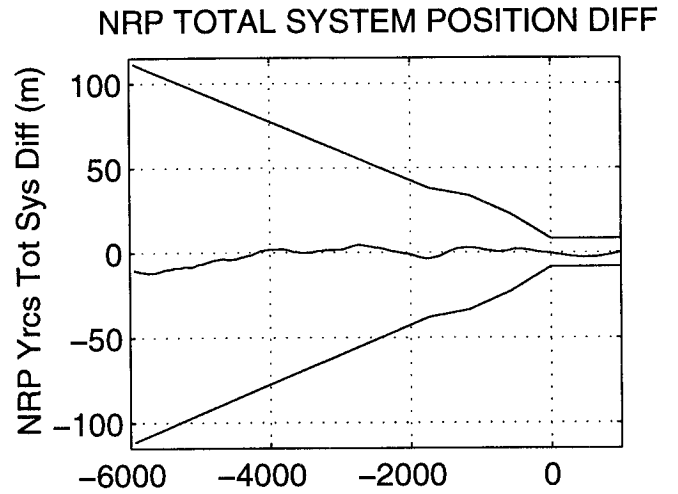
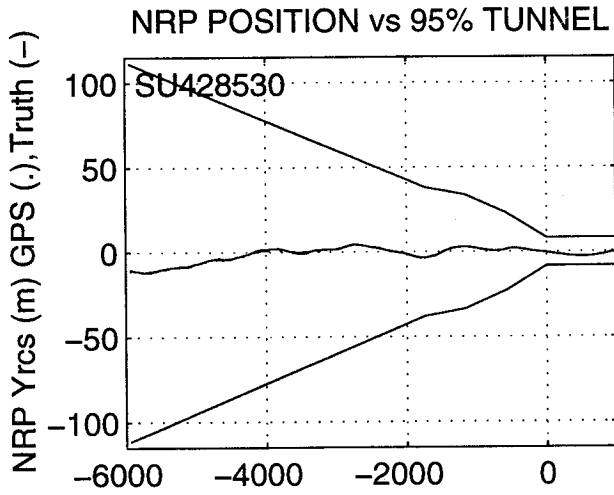
NRP Xrcs MEAN DIFFERENCE (m): 0.470
NRP Yrcs MEAN DIFFERENCE (m): -0.065
NRP Zrcs MEAN DIFFERENCE (m): 0.007

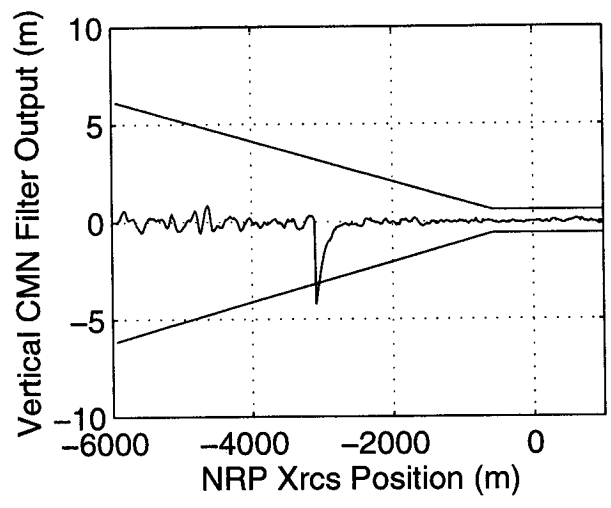
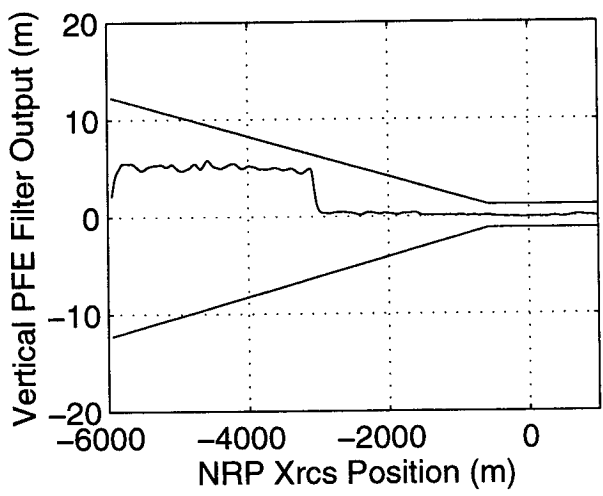
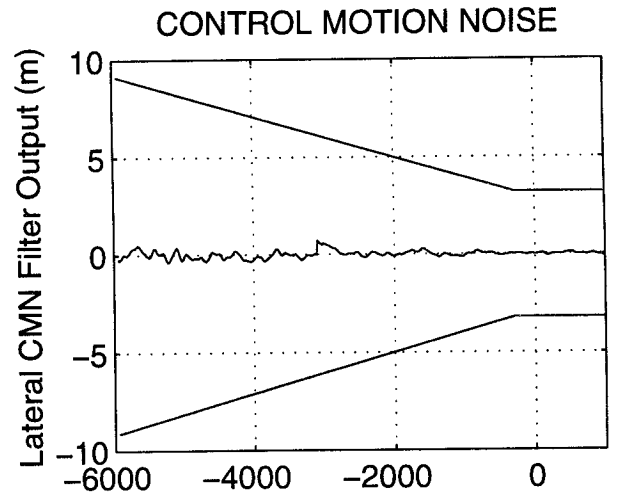
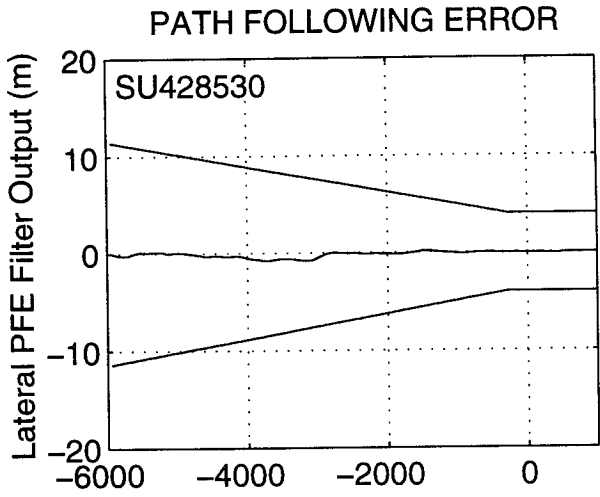
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.263
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.126
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.180

NRP Xrcs 2-RMS DIFFERENCE (m): 0.976
NRP Yrcs 2-RMS DIFFERENCE (m): 0.180
NRP Zrcs 2-RMS DIFFERENCE (m): 0.181

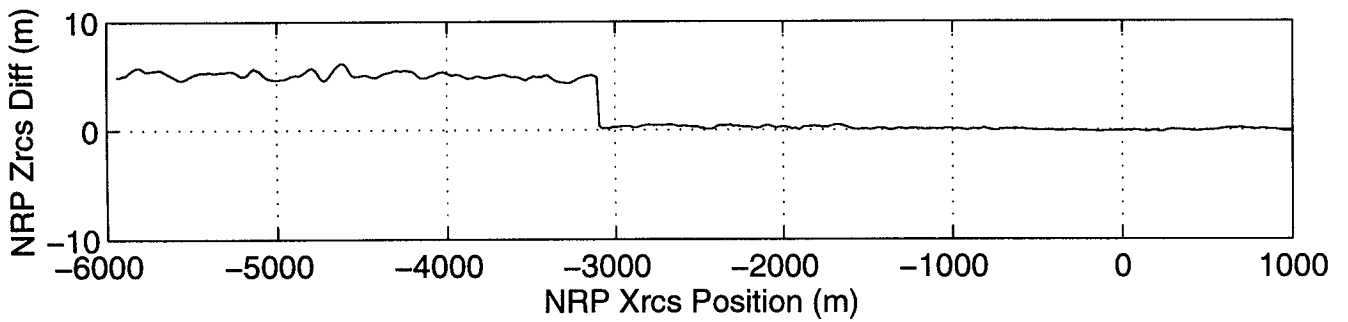
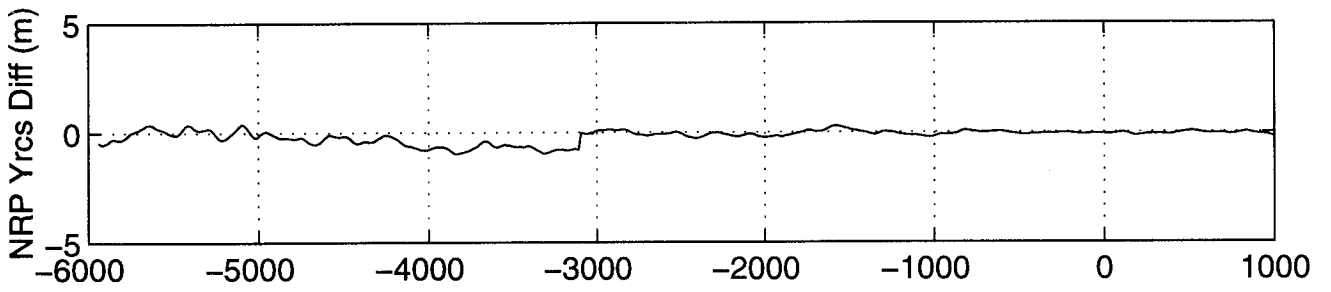
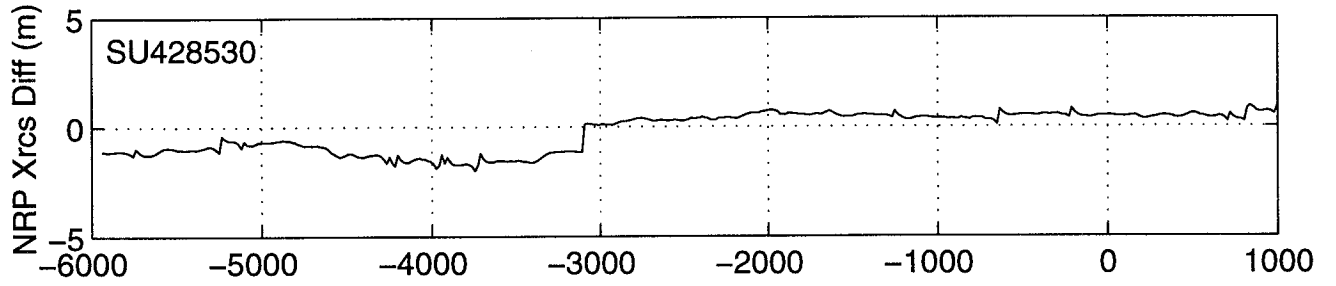
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 163.649
LGRP Yrcs POSITION (m): -1.566





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428532
START TIME: 327973.249
STOP TIME: 328082.249

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.4
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.540
NRP Yrcs MEAN DIFFERENCE (m): -0.022
NRP Zrcs MEAN DIFFERENCE (m): -0.016

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.202
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.132
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.180

NRP Xrcs 2-RMS DIFFERENCE (m): 1.099
NRP Yrcs 2-RMS DIFFERENCE (m): 0.139
NRP Zrcs 2-RMS DIFFERENCE (m): 0.183

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 170.224
LGRP Yrcs POSITION (m): -0.266

APPROACH #: SU428532
START TIME: 327973.249
STOP TIME: 328082.249

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.4
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* MEIHD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

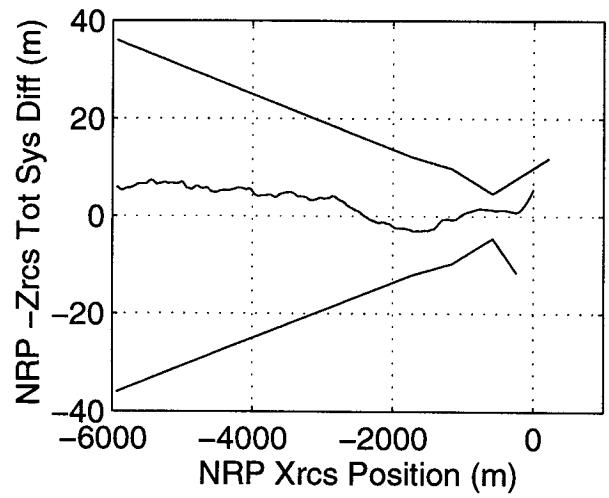
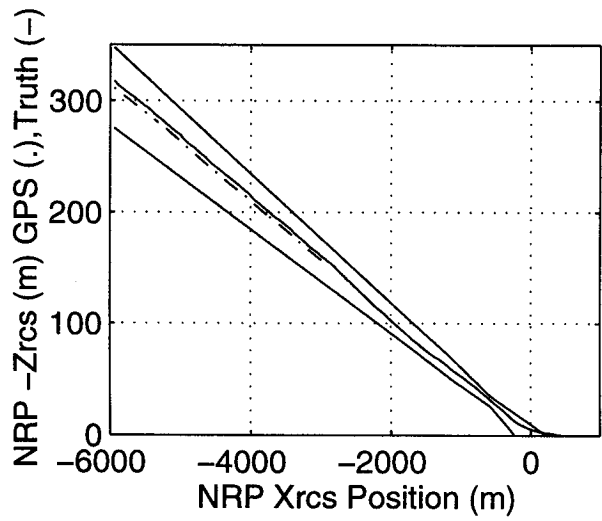
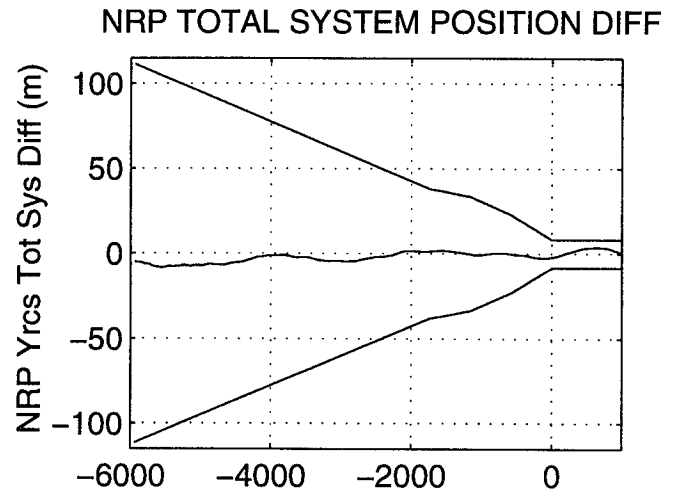
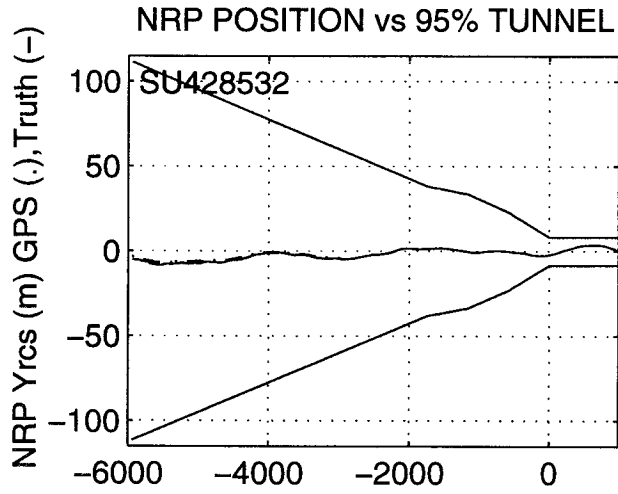
NRP Xrcs MEAN DIFFERENCE (m): 0.540
NRP Yrcs MEAN DIFFERENCE (m): -0.022
NRP Zrcs MEAN DIFFERENCE (m): -0.016

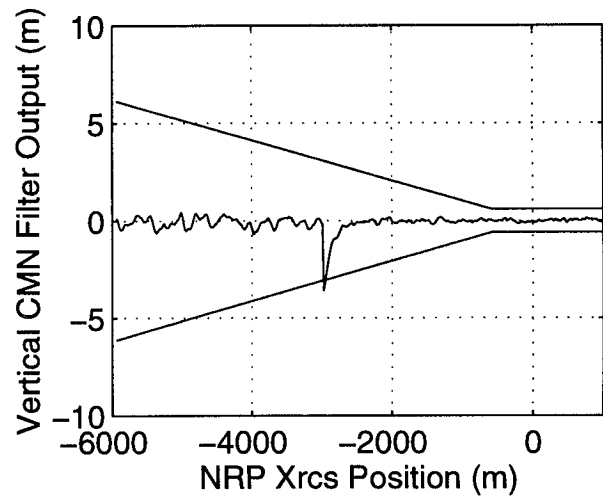
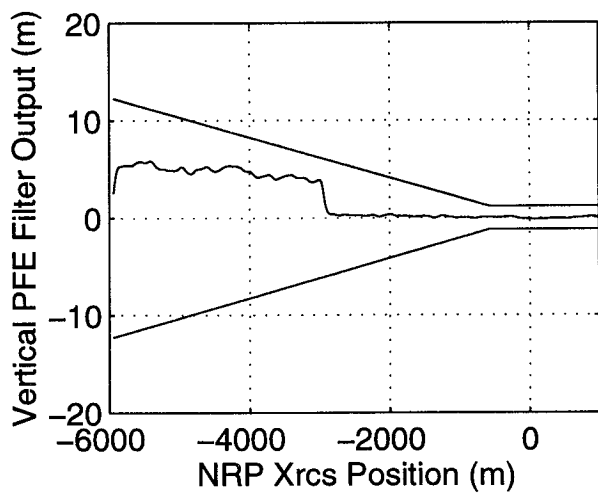
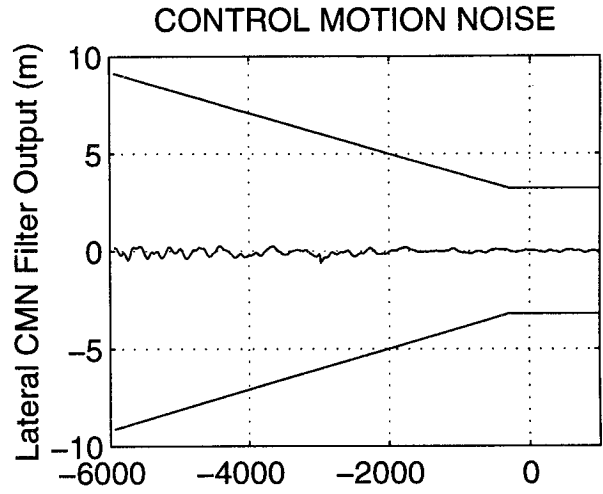
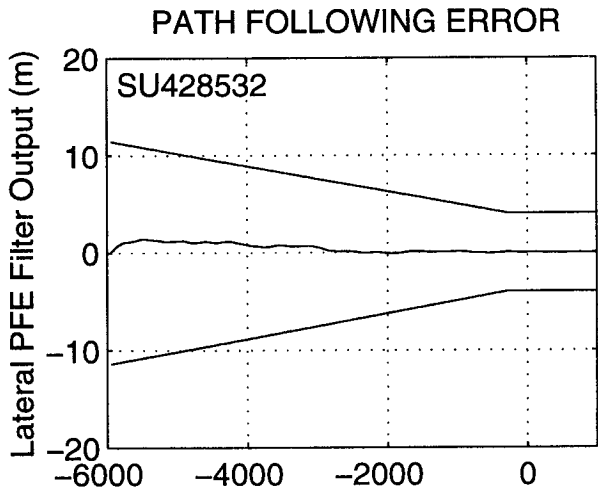
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.202
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.132
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.180

NRP Xrcs 2-RMS DIFFERENCE (m): 1.099
NRP Yrcs 2-RMS DIFFERENCE (m): 0.139
NRP Zrcs 2-RMS DIFFERENCE (m): 0.183

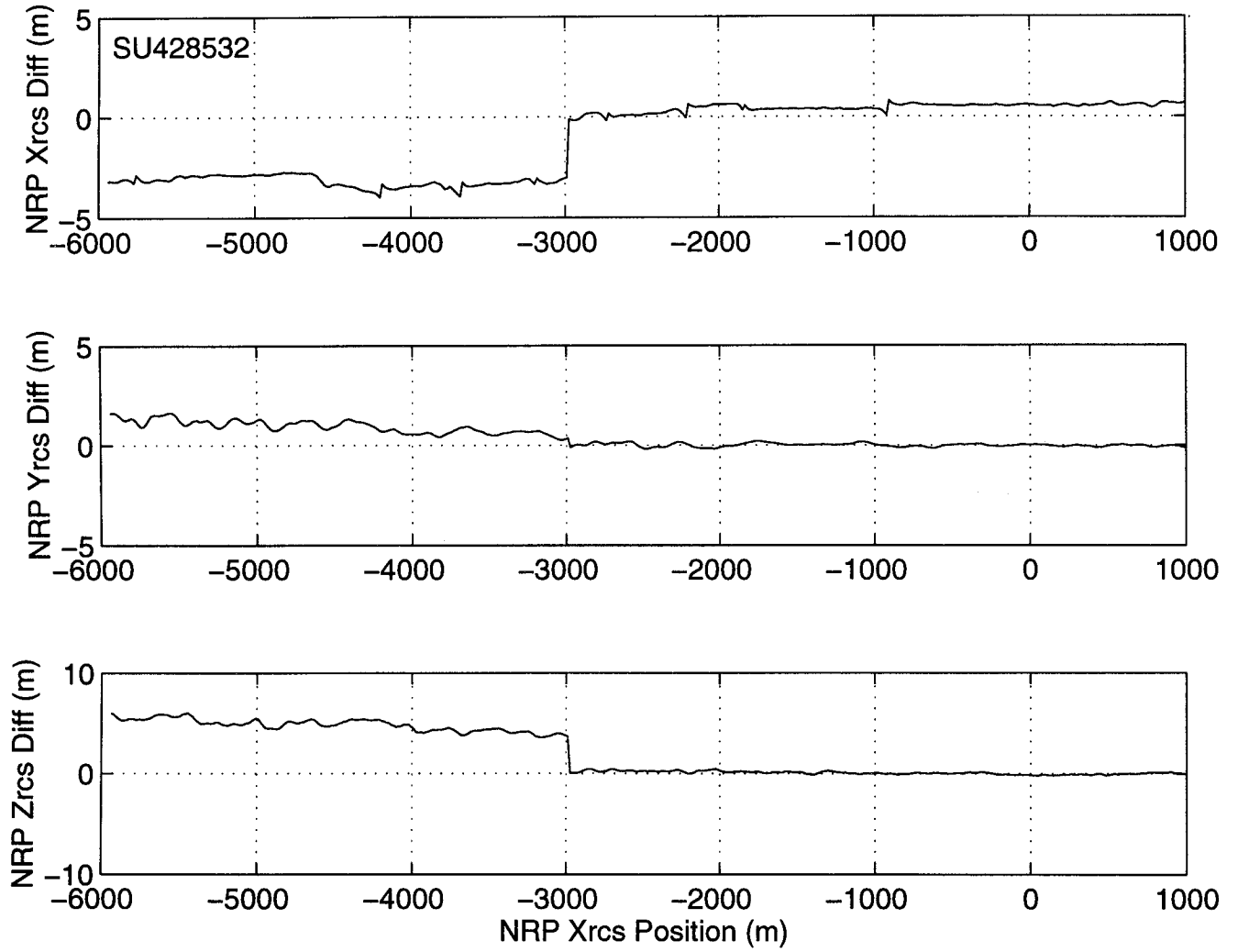
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 170.224
LGRP Yrcs POSITION (m): -0.266





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428534
START TIME: 328379.499
STOP TIME: 328486.999

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.6
AVERAGE VDOP: 5.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.594
NRP Yrcs MEAN DIFFERENCE (m): -0.052
NRP Zrcs MEAN DIFFERENCE (m): 0.070

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.186
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.145
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.182

NRP Xrcs 2-RMS DIFFERENCE (m): 1.202
NRP Yrcs 2-RMS DIFFERENCE (m): 0.179
NRP Zrcs 2-RMS DIFFERENCE (m): 0.230

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 212.295
LGRP Yrcs POSITION (m): 3.422

APPROACH #: SU428534
START TIME: 328379.499
STOP TIME: 328486.999

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.6
AVERAGE VDOP: 5.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

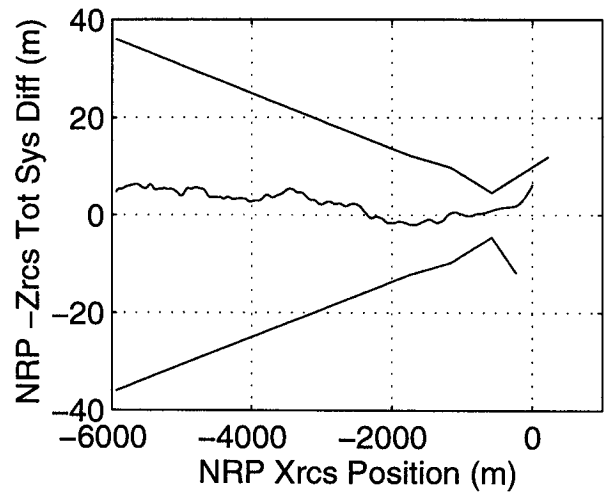
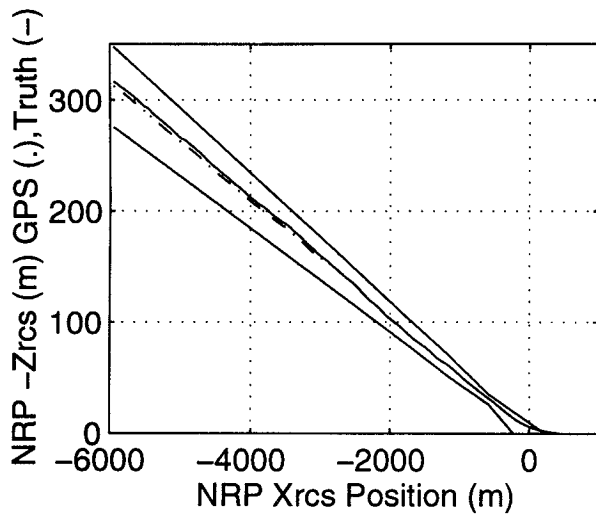
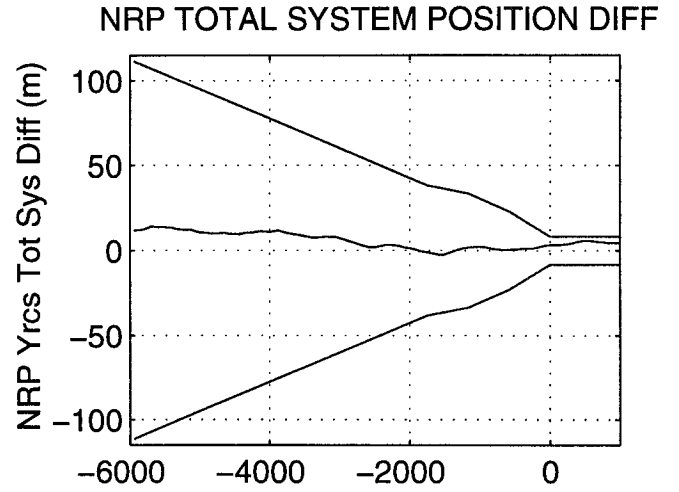
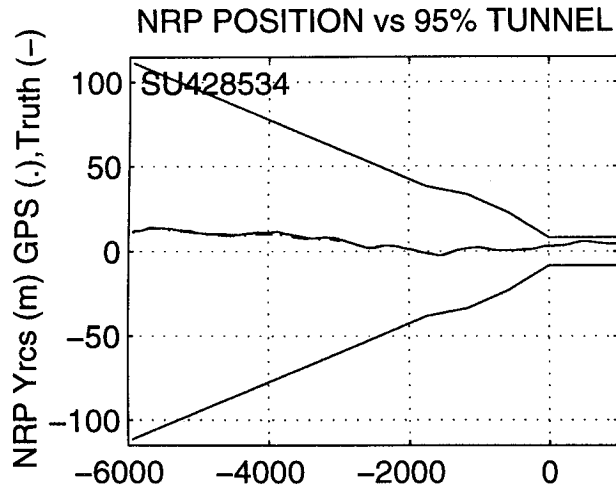
NRP Xrcs MEAN DIFFERENCE (m): 0.594
NRP Yrcs MEAN DIFFERENCE (m): -0.052
NRP Zrcs MEAN DIFFERENCE (m): 0.070

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.186
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.145
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.182

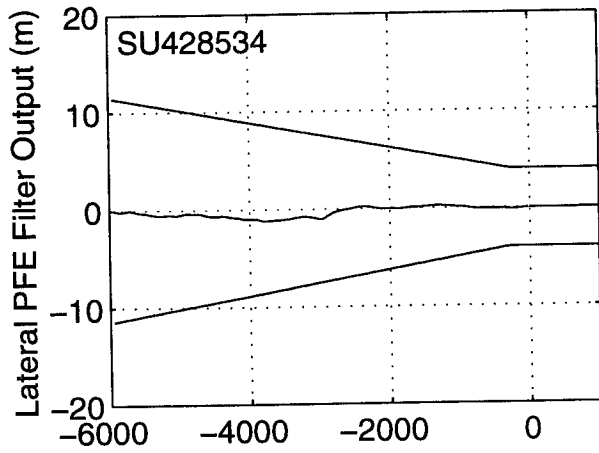
NRP Xrcs 2-RMS DIFFERENCE (m): 1.202
NRP Yrcs 2-RMS DIFFERENCE (m): 0.179
NRP Zrcs 2-RMS DIFFERENCE (m): 0.230

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

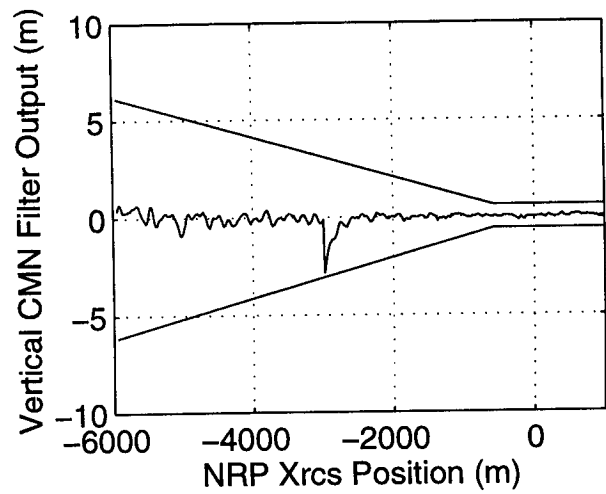
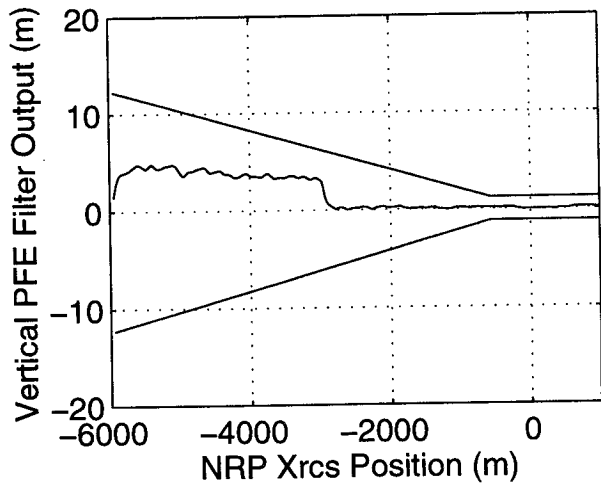
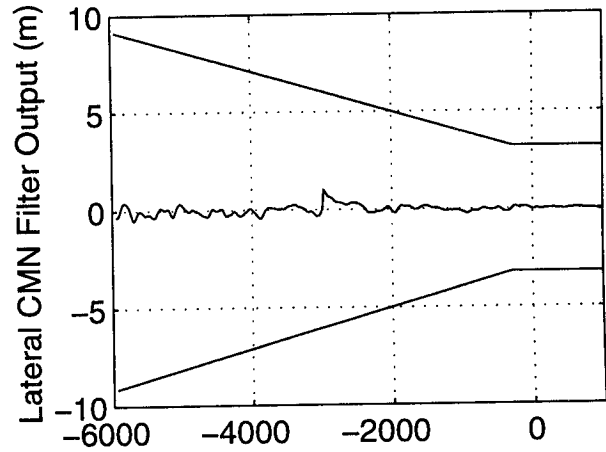
LGRP Xrcs POSITION (m): 212.295
LGRP Yrcs POSITION (m): 3.422



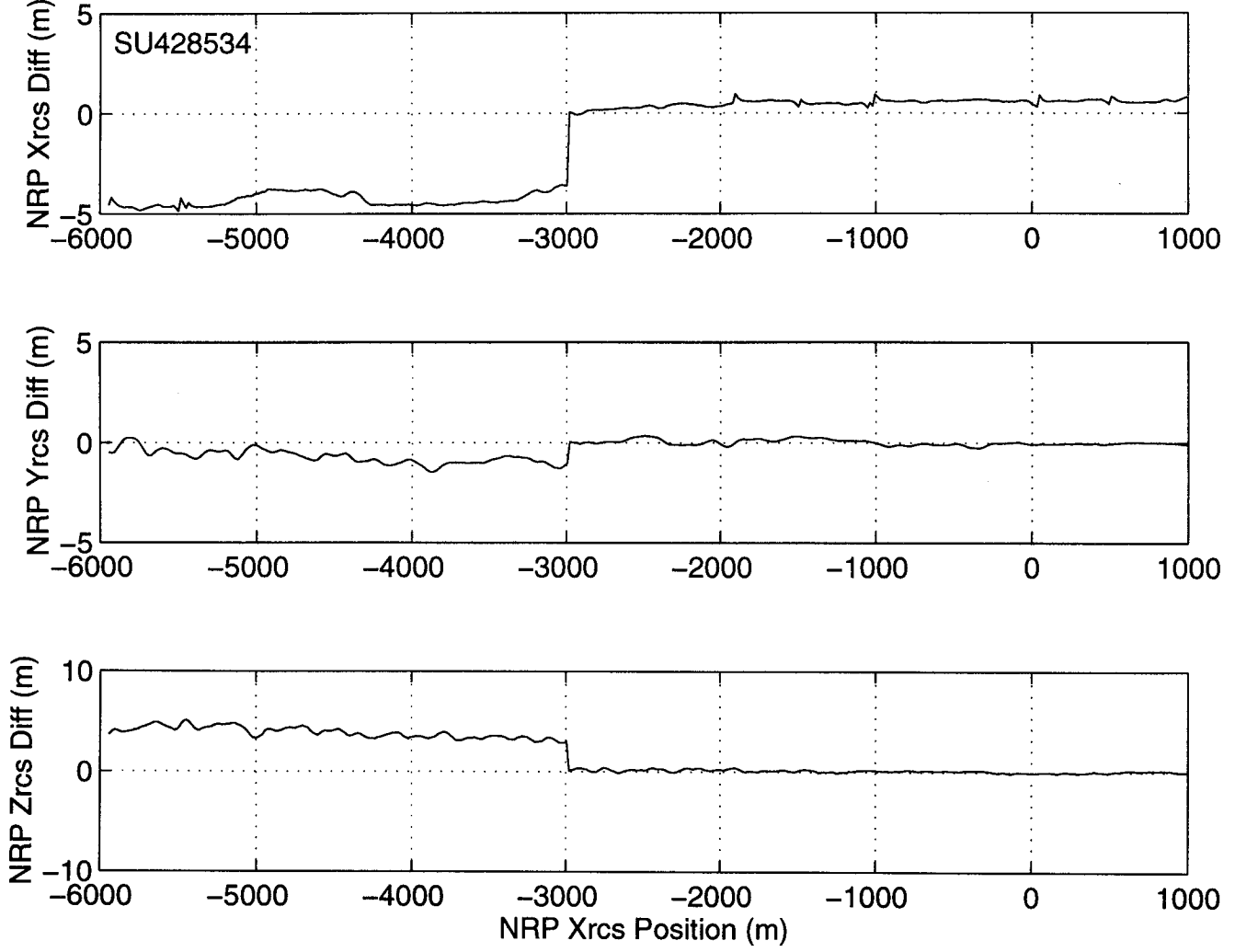
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428536
START TIME: 328798.749
STOP TIME: 328905.499

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 5.9
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.515
NRP Yrcs MEAN DIFFERENCE (m): -0.145
NRP Zrcs MEAN DIFFERENCE (m): -0.056

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.177
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.187
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.175

NRP Xrcs 2-RMS DIFFERENCE (m): 1.044
NRP Yrcs 2-RMS DIFFERENCE (m): 0.346
NRP Zrcs 2-RMS DIFFERENCE (m): 0.208

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 187.576
LGRP Yrcs POSITION (m): 1.400

APPROACH #: SU428536
START TIME: 328798.749
STOP TIME: 328905.499

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 5.9
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

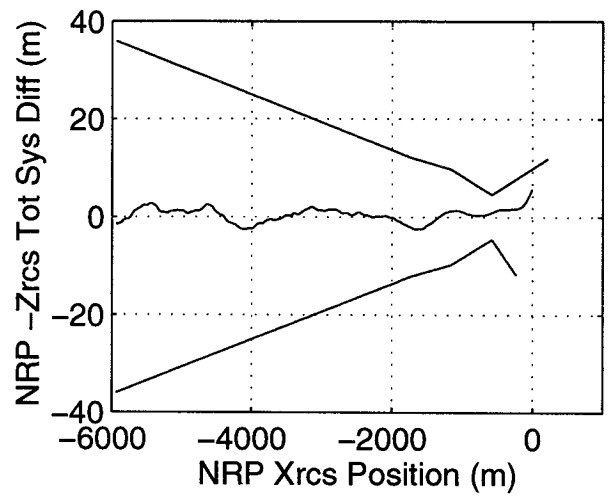
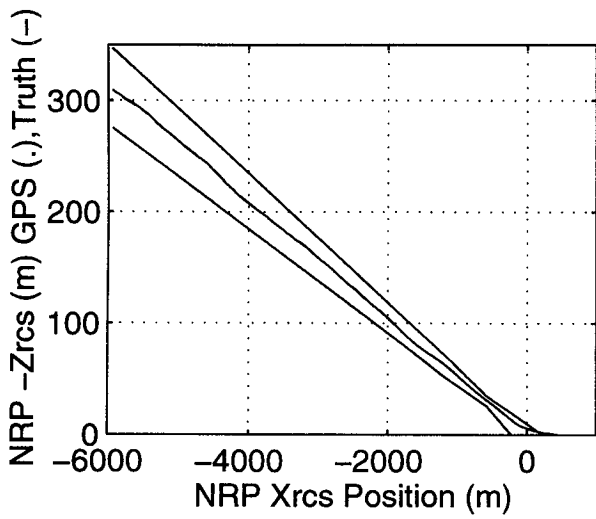
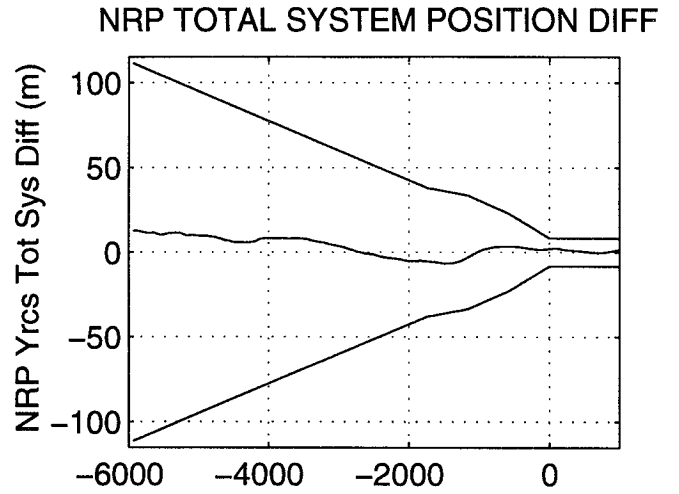
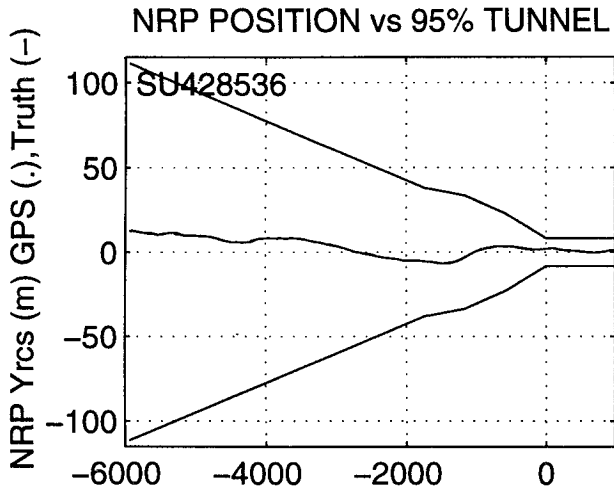
NRP Xrcs MEAN DIFFERENCE (m): 0.515
NRP Yrcs MEAN DIFFERENCE (m): -0.145
NRP Zrcs MEAN DIFFERENCE (m): -0.056

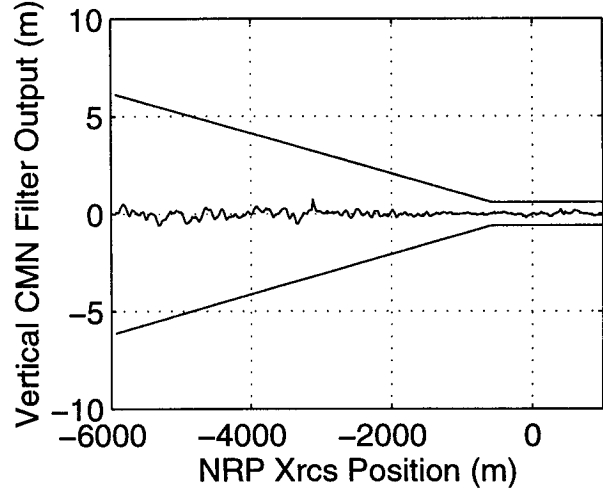
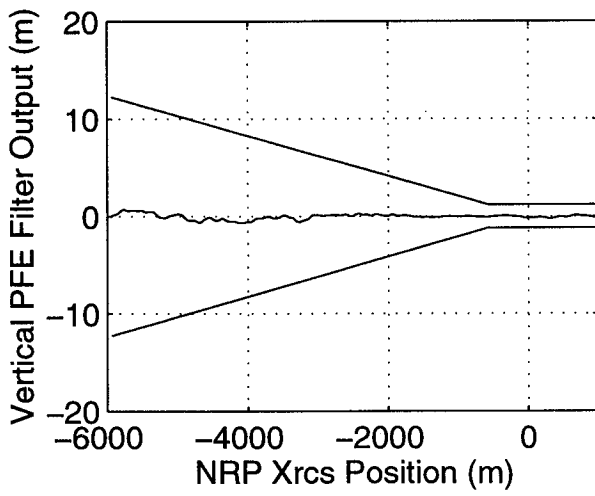
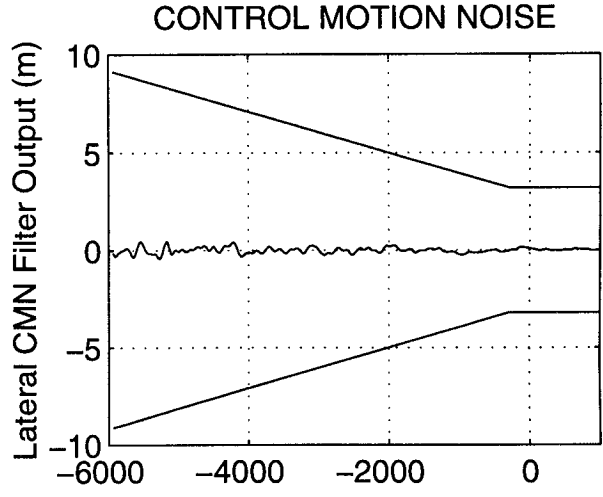
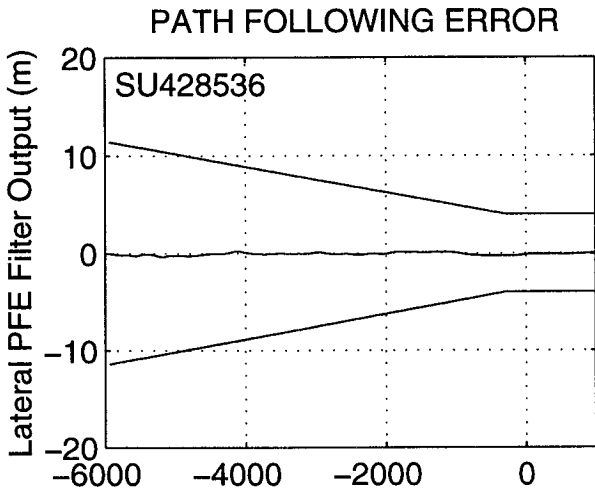
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.177
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.187
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.175

NRP Xrcs 2-RMS DIFFERENCE (m): 1.044
NRP Yrcs 2-RMS DIFFERENCE (m): 0.346
NRP Zrcs 2-RMS DIFFERENCE (m): 0.208

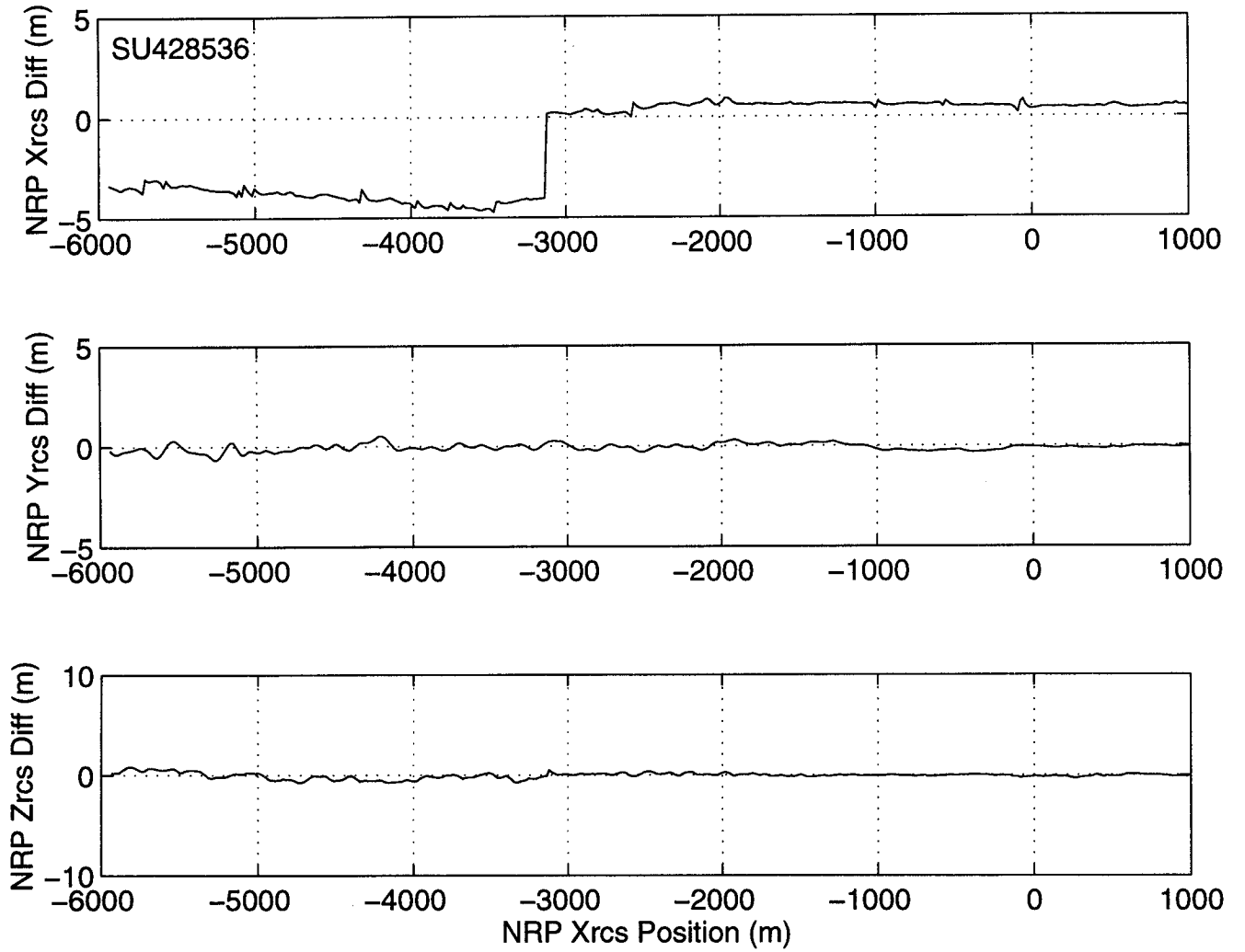
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 187.576
LGRP Yrcs POSITION (m): 1.400





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428538
START TIME: 329209.999
STOP TIME: 329316.499

MINIMUM HDOP: 3.4
MAXIMUM HDOP: 3.4
AVERAGE HDOP: 3.4

MINIMUM VDOP: 6.2
MAXIMUM VDOP: 6.4
AVERAGE VDOP: 6.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.494
NRP Yrcs MEAN DIFFERENCE (m): -0.140
NRP Zrcs MEAN DIFFERENCE (m): -0.050

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.259
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.281
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.212

NRP Xrcs 2-RMS DIFFERENCE (m): 1.022
NRP Yrcs 2-RMS DIFFERENCE (m): 0.397
NRP Zrcs 2-RMS DIFFERENCE (m): 0.235

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 162.387
LGRP Yrcs POSITION (m): -2.614

APPROACH #: SU428538
START TIME: 329209.999
STOP TIME: 329316.499

MINIMUM HDOP: 3.4
MAXIMUM HDOP: 3.4
AVERAGE HDOP: 3.4

MINIMUM VDOP: 6.2
MAXIMUM VDOP: 6.4
AVERAGE VDOP: 6.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

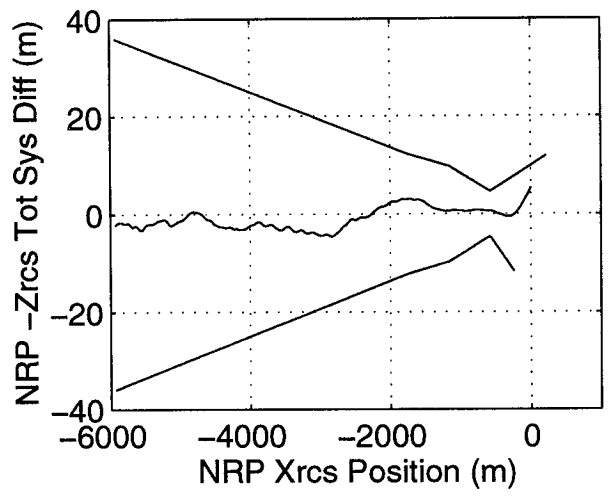
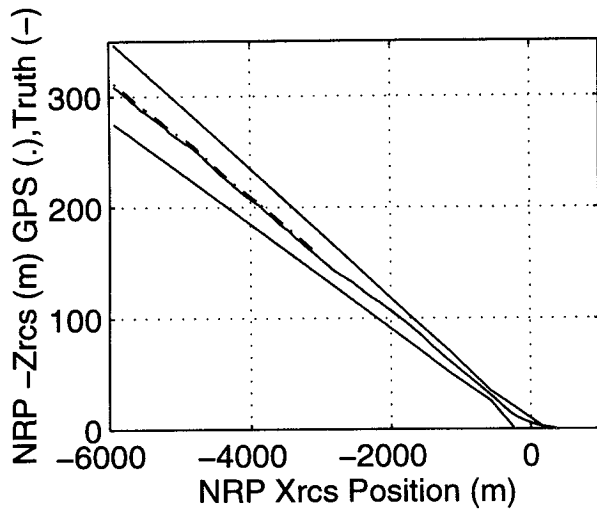
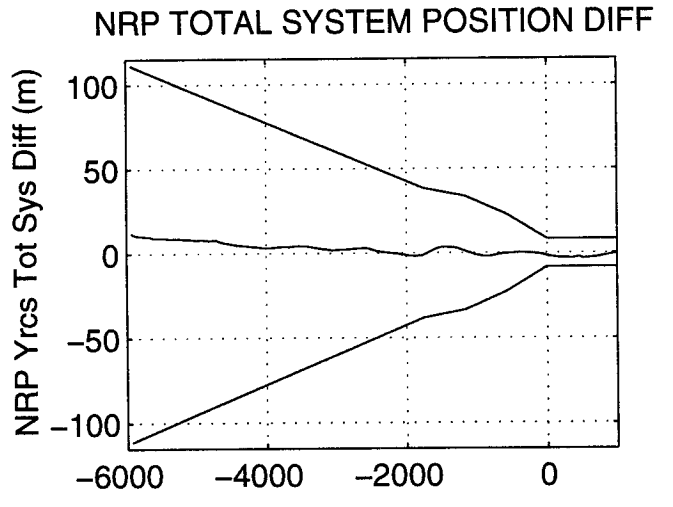
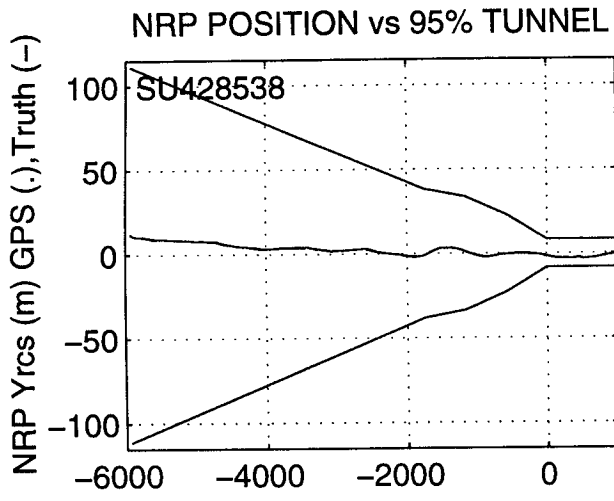
NRP Xrcs MEAN DIFFERENCE (m): 0.494
NRP Yrcs MEAN DIFFERENCE (m): -0.140
NRP Zrcs MEAN DIFFERENCE (m): -0.050

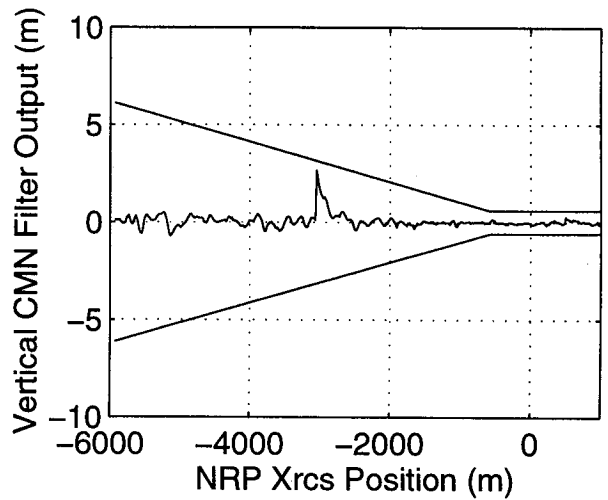
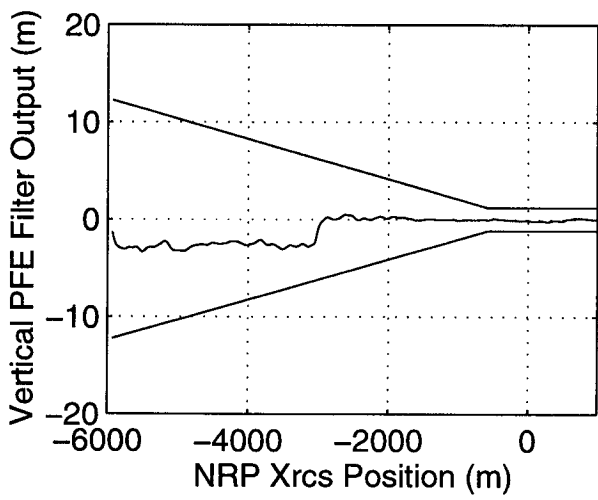
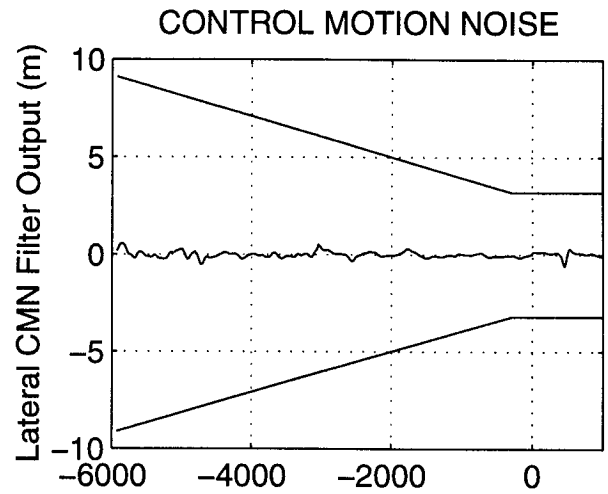
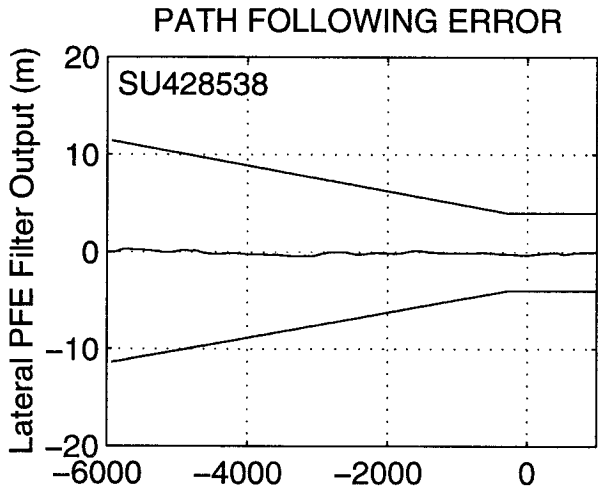
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.259
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.281
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.212

NRP Xrcs 2-RMS DIFFERENCE (m): 1.022
NRP Yrcs 2-RMS DIFFERENCE (m): 0.397
NRP Zrcs 2-RMS DIFFERENCE (m): 0.235

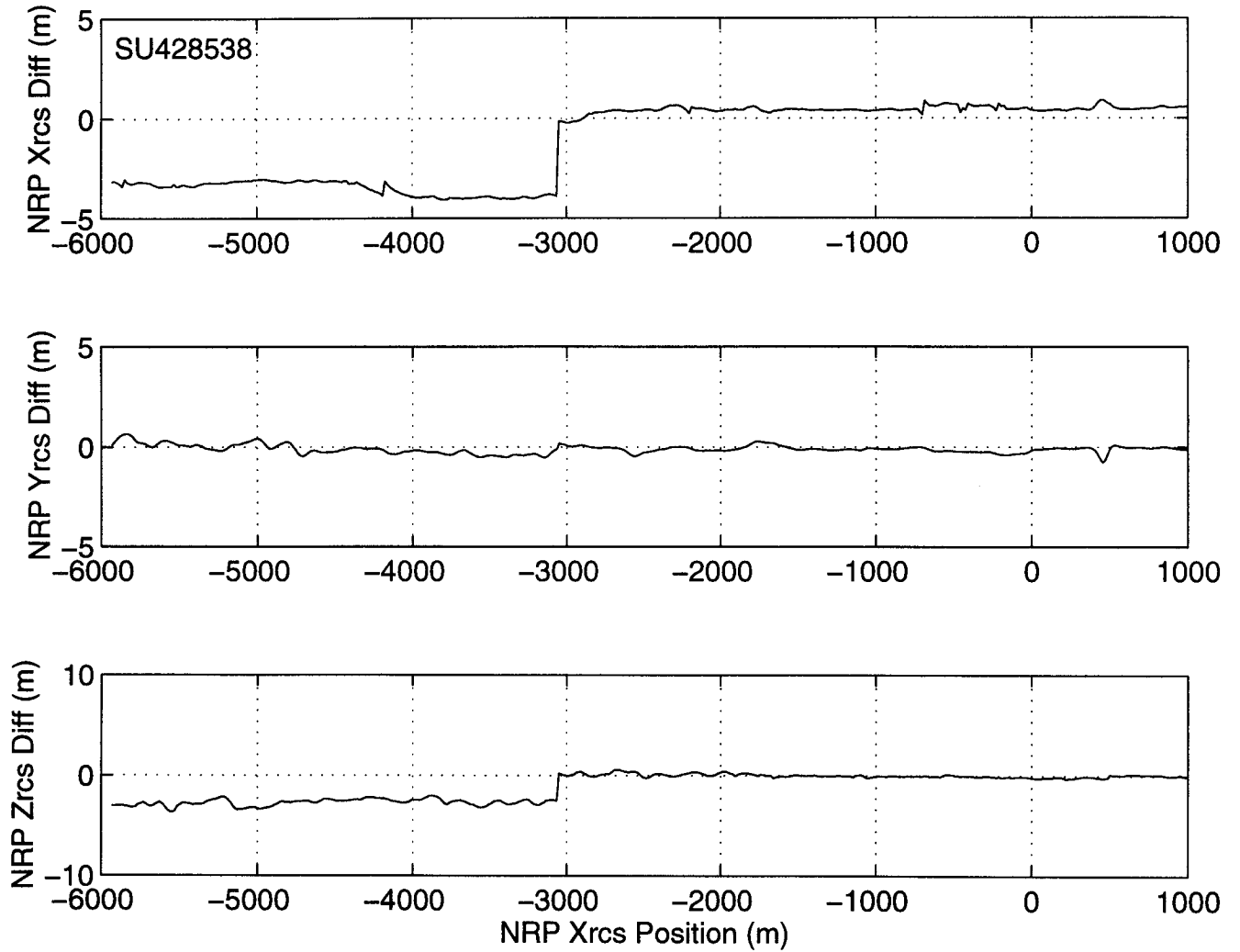
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 162.387
LGRP Yrcs POSITION (m): -2.614





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428540
START TIME: 329628.249
STOP TIME: 329734.249

MINIMUM HDOP: 3.6
MAXIMUM HDOP: 3.7
AVERAGE HDOP: 3.6

MINIMUM VDOP: 7.0
MAXIMUM VDOP: 7.2
AVERAGE VDOP: 7.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.490
NRP Yrcs MEAN DIFFERENCE (m): -0.056
NRP Zrcs MEAN DIFFERENCE (m): 0.042

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.422
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.109
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.192

NRP Xrcs 2-RMS DIFFERENCE (m): 1.068
NRP Yrcs 2-RMS DIFFERENCE (m): 0.157
NRP Zrcs 2-RMS DIFFERENCE (m): 0.210

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.001
LGRP Yrcs POSITION (m): -0.893

APPROACH #: SU428540
START TIME: 329628.249
STOP TIME: 329734.249

MINIMUM HDOP: 3.6
MAXIMUM HDOP: 3.7
AVERAGE HDOP: 3.6

MINIMUM VDOP: 7.0
MAXIMUM VDOP: 7.2
AVERAGE VDOP: 7.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

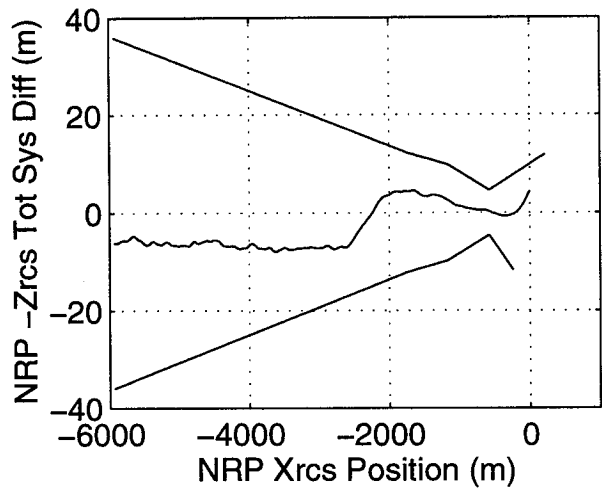
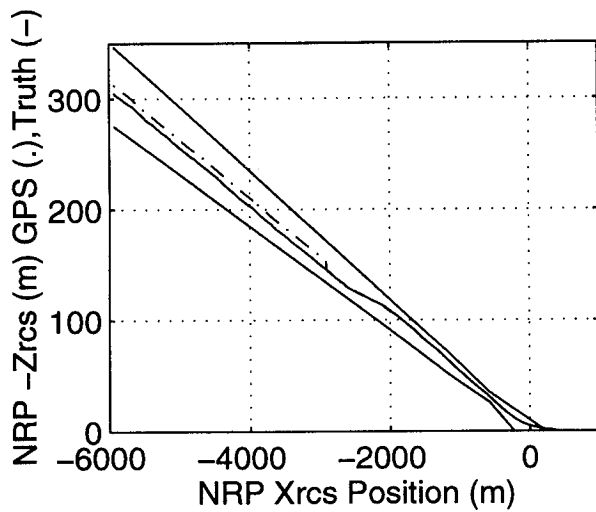
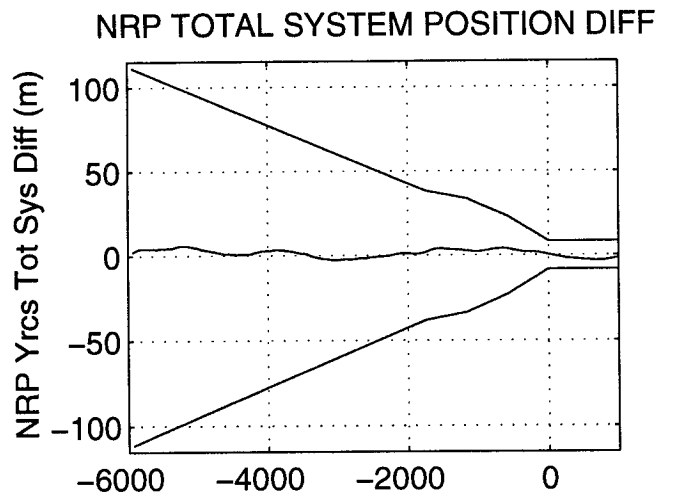
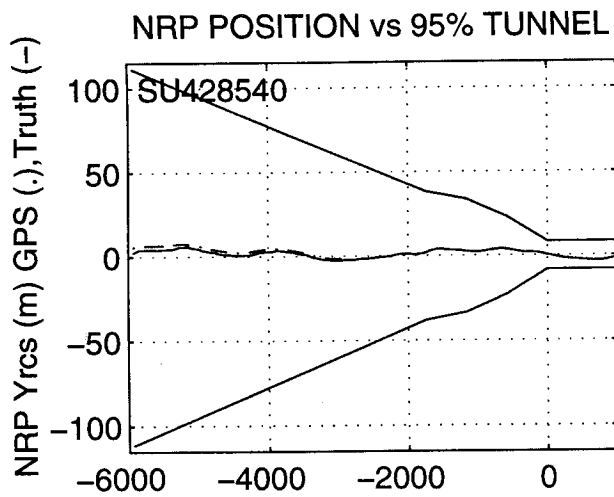
NRP Xrcs MEAN DIFFERENCE (m): 0.490
NRP Yrcs MEAN DIFFERENCE (m): -0.056
NRP Zrcs MEAN DIFFERENCE (m): 0.042

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.422
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.109
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.192

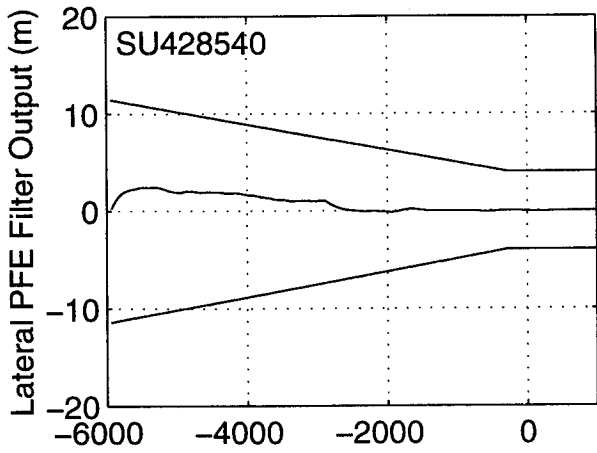
NRP Xrcs 2-RMS DIFFERENCE (m): 1.068
NRP Yrcs 2-RMS DIFFERENCE (m): 0.157
NRP Zrcs 2-RMS DIFFERENCE (m): 0.210

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

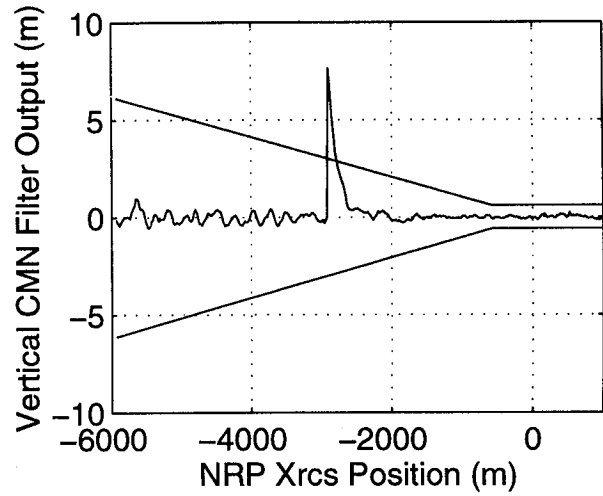
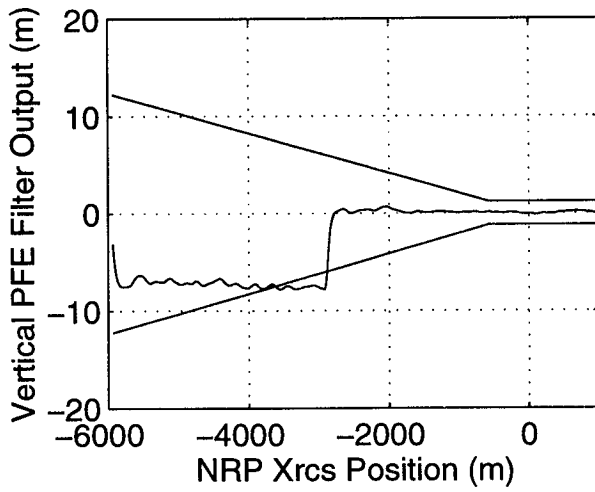
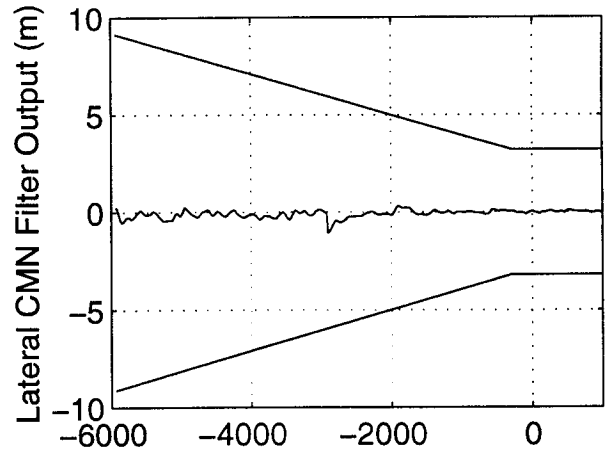
LGRP Xrcs POSITION (m): 153.001
LGRP Yrcs POSITION (m): -0.893



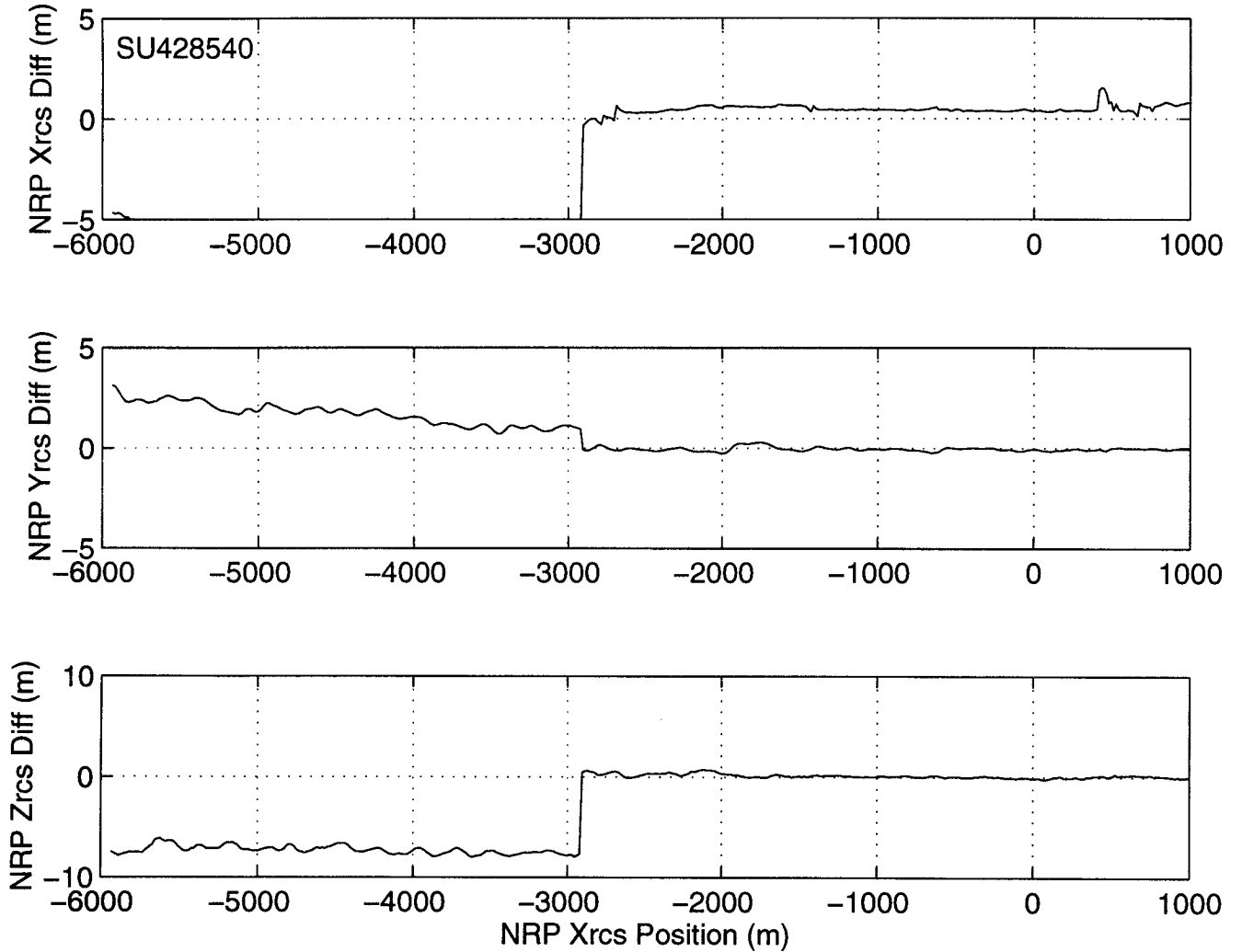
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428542
START TIME: 330027.749
STOP TIME: 330137.249

MINIMUM HDOP: 3.8
MAXIMUM HDOP: 3.9
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.0
MAXIMUM VDOP: 8.3
AVERAGE VDOP: 8.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.521
NRP Yrcs MEAN DIFFERENCE (m): -0.036
NRP Zrcs MEAN DIFFERENCE (m): 0.059

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.405
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.196
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.294

NRP Xrcs 2-RMS DIFFERENCE (m): 1.117
NRP Yrcs 2-RMS DIFFERENCE (m): 0.209
NRP Zrcs 2-RMS DIFFERENCE (m): 0.317

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 95.967
LGRP Yrcs POSITION (m): 0.325

APPROACH #: SU428542
START TIME: 330027.749
STOP TIME: 330137.249

MINIMUM HDOP: 3.8
MAXIMUM HDOP: 3.9
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.0
MAXIMUM VDOP: 8.3
AVERAGE VDOP: 8.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

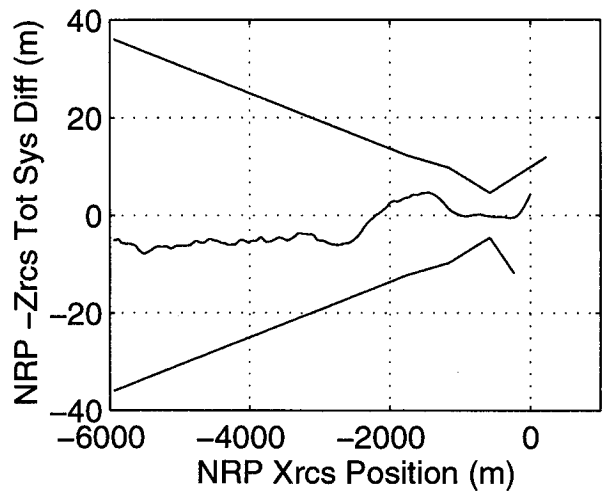
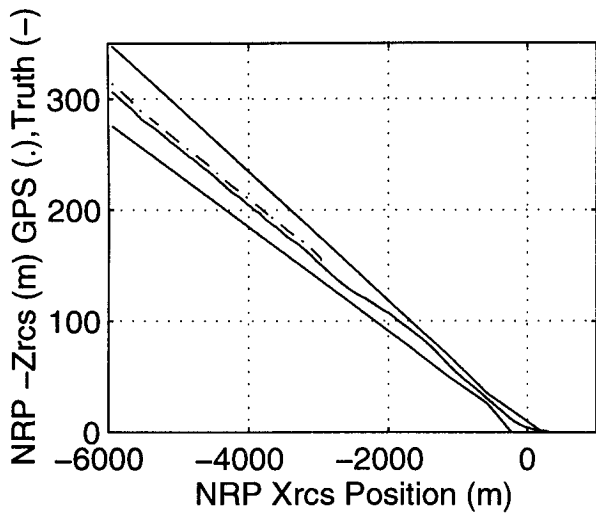
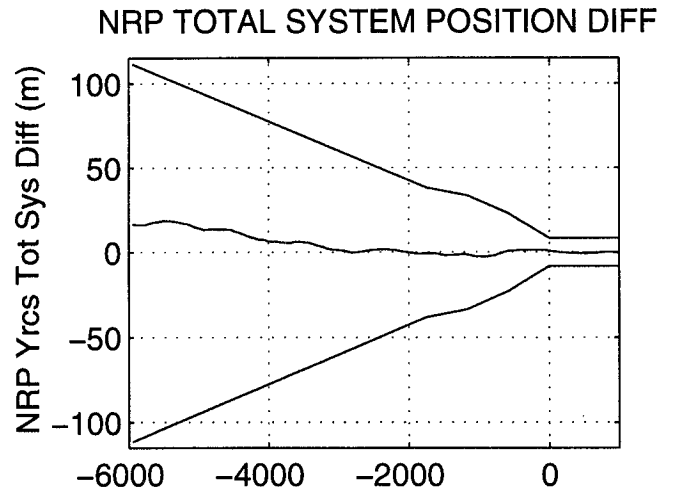
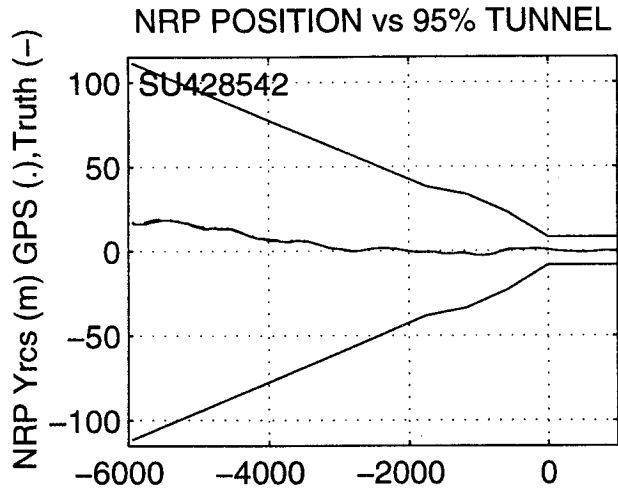
NRP Xrcs MEAN DIFFERENCE (m): 0.521
NRP Yrcs MEAN DIFFERENCE (m): -0.036
NRP Zrcs MEAN DIFFERENCE (m): 0.059

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.405
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.196
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.294

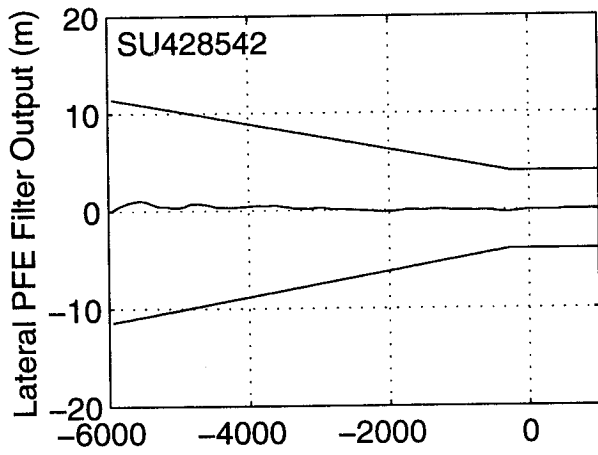
NRP Xrcs 2-RMS DIFFERENCE (m): 1.117
NRP Yrcs 2-RMS DIFFERENCE (m): 0.209
NRP Zrcs 2-RMS DIFFERENCE (m): 0.317

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

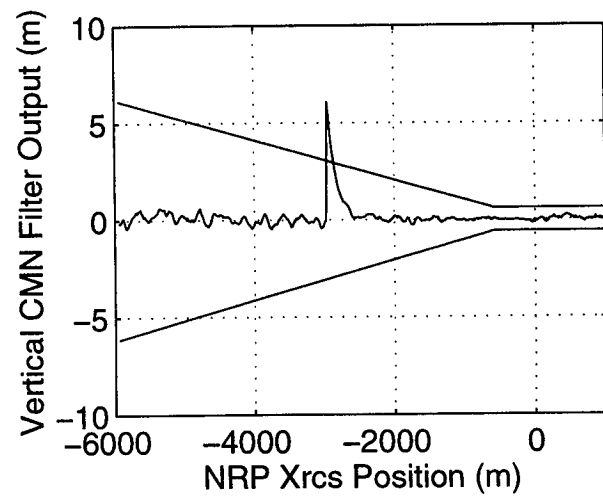
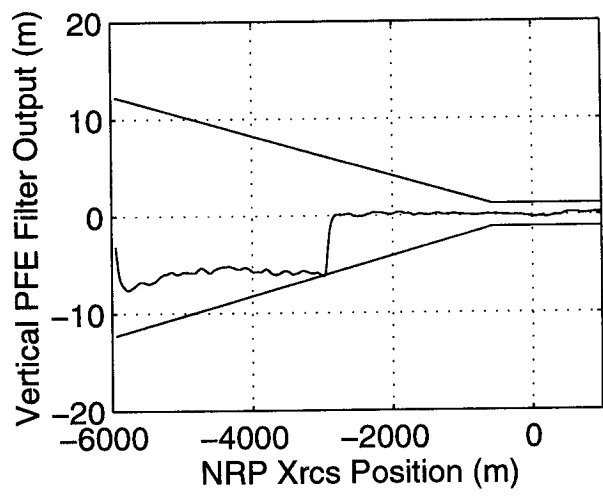
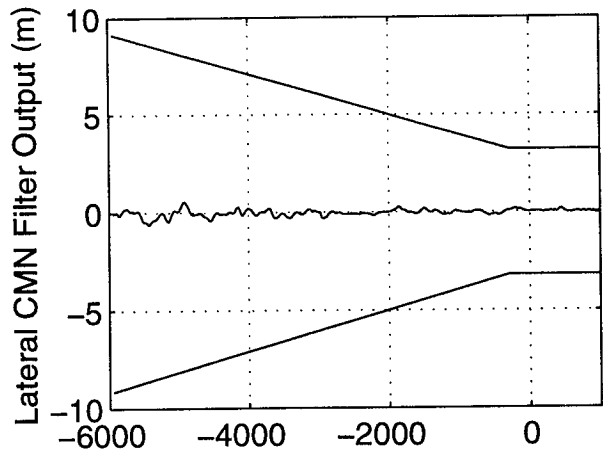
LGRP Xrcs POSITION (m): 95.967
LGRP Yrcs POSITION (m): 0.325



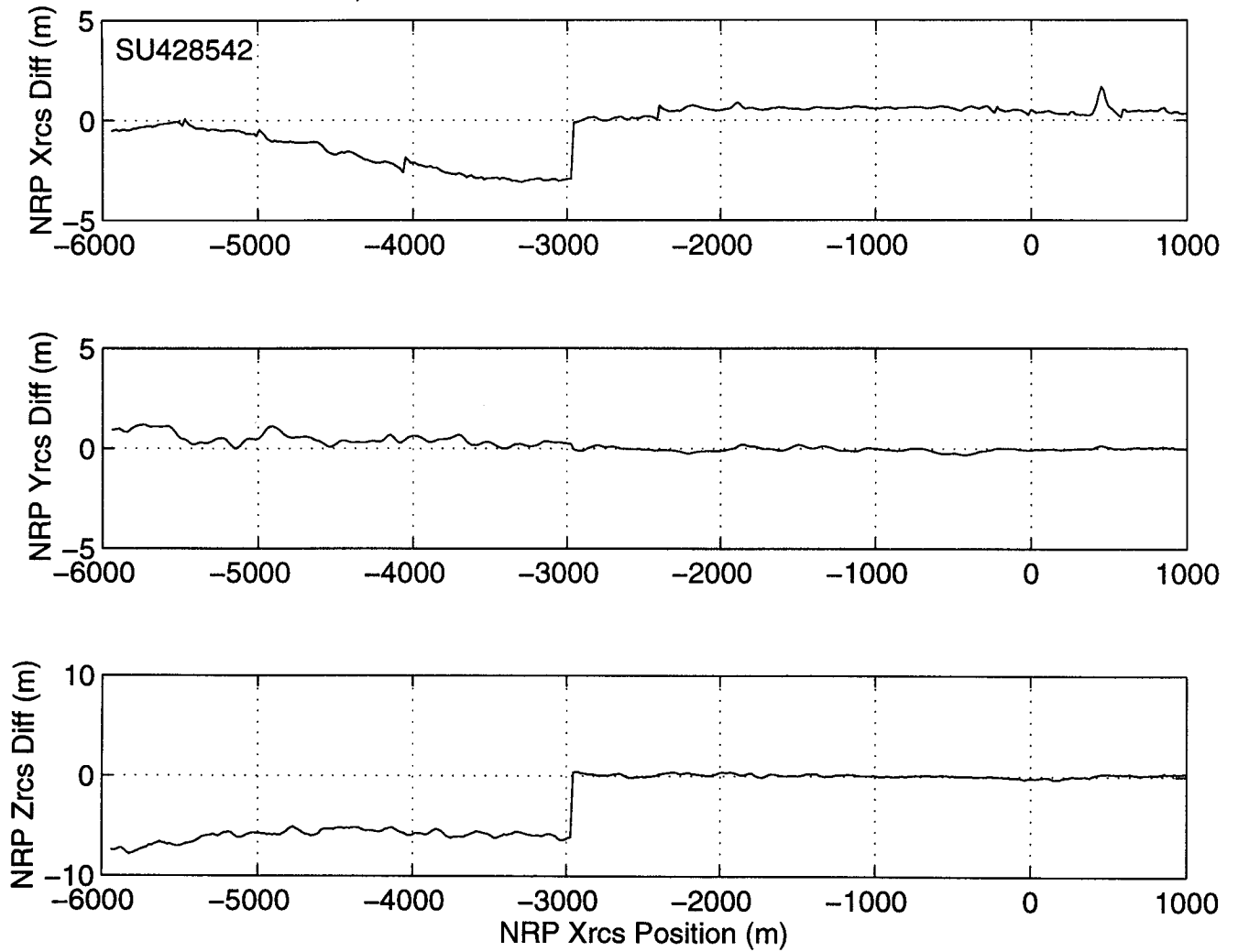
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428544
START TIME: 331091.999
STOP TIME: 331206.749

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 10.4
MAXIMUM VDOP: 10.4
AVERAGE VDOP: 10.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.602
NRP Yrcs MEAN DIFFERENCE (m): -0.253
NRP Zrcs MEAN DIFFERENCE (m): 0.249

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.377
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.241
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.312

NRP Xrcs 2-RMS DIFFERENCE (m): 1.261
NRP Yrcs 2-RMS DIFFERENCE (m): 0.560
NRP Zrcs 2-RMS DIFFERENCE (m): 0.588

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 48.651
LGRP Yrcs POSITION (m): 0.025

APPROACH #: SU428544
START TIME: 331091.999
STOP TIME: 331206.749

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 10.4
MAXIMUM VDOP: 10.4
AVERAGE VDOP: 10.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

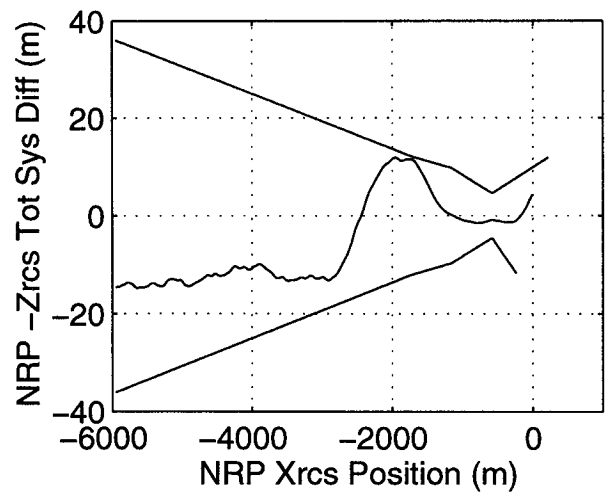
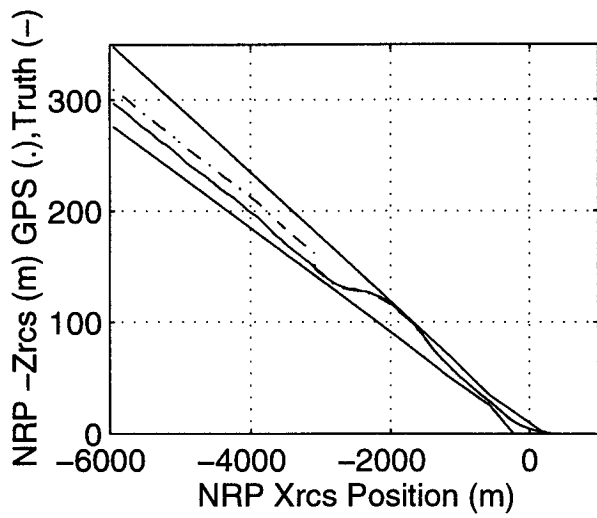
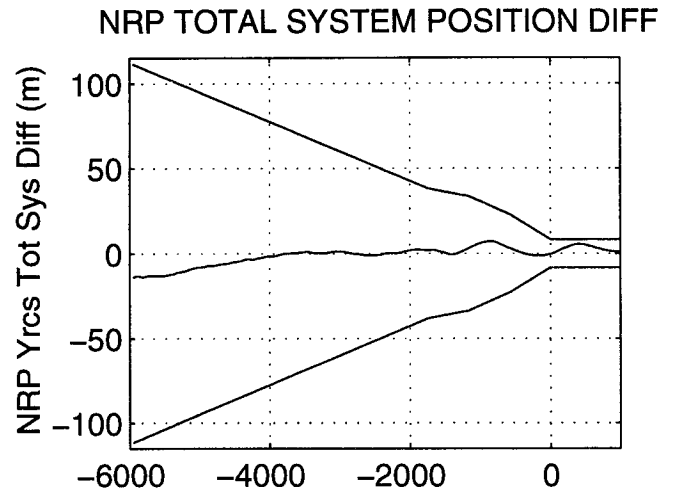
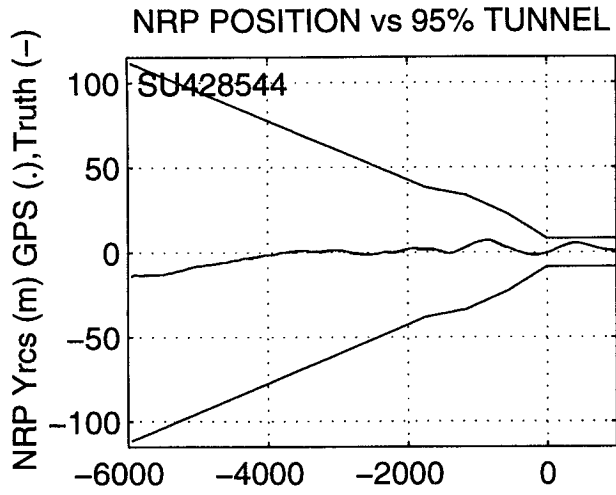
NRP Xrcs MEAN DIFFERENCE (m): 0.602
NRP Yrcs MEAN DIFFERENCE (m): -0.253
NRP Zrcs MEAN DIFFERENCE (m): 0.249

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.377
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.241
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.312

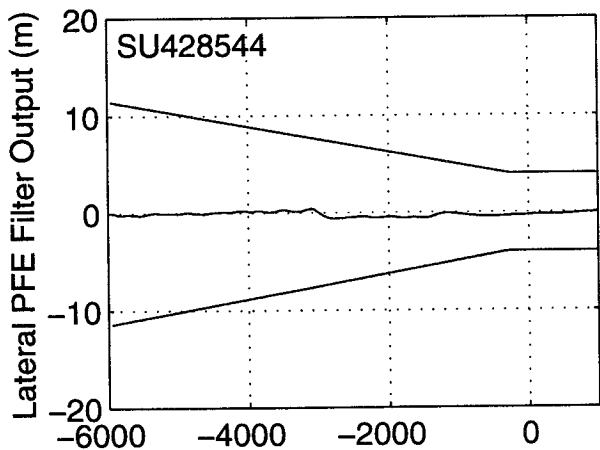
NRP Xrcs 2-RMS DIFFERENCE (m): 1.261
NRP Yrcs 2-RMS DIFFERENCE (m): 0.560
NRP Zrcs 2-RMS DIFFERENCE (m): 0.588

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

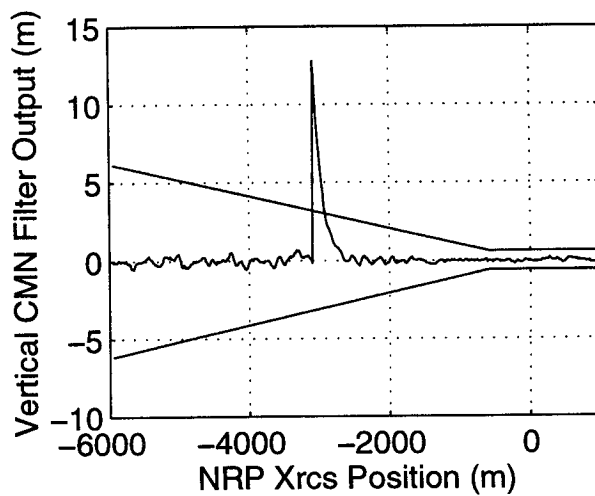
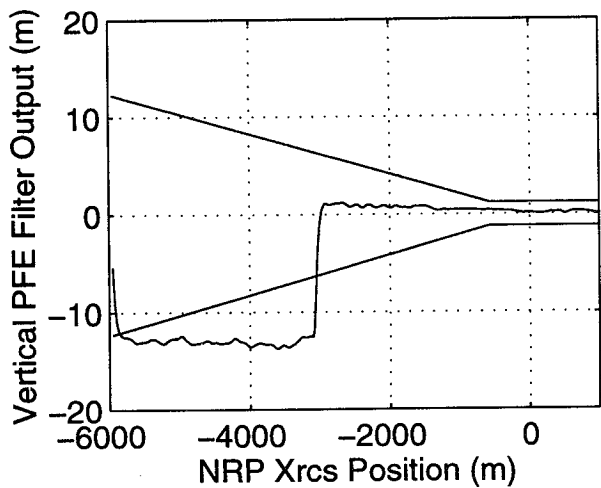
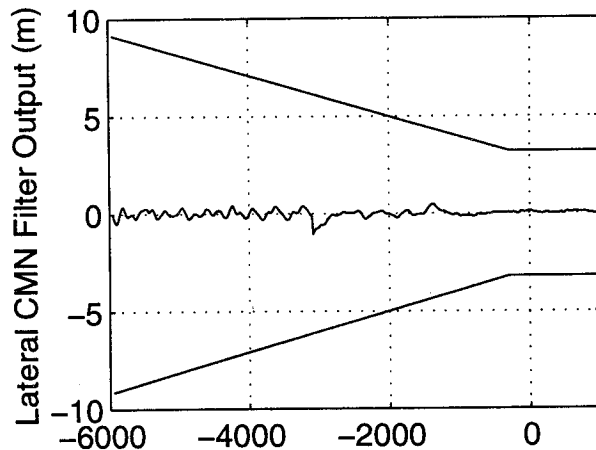
LGRP Xrcs POSITION (m): 48.651
LGRP Yrcs POSITION (m): 0.025



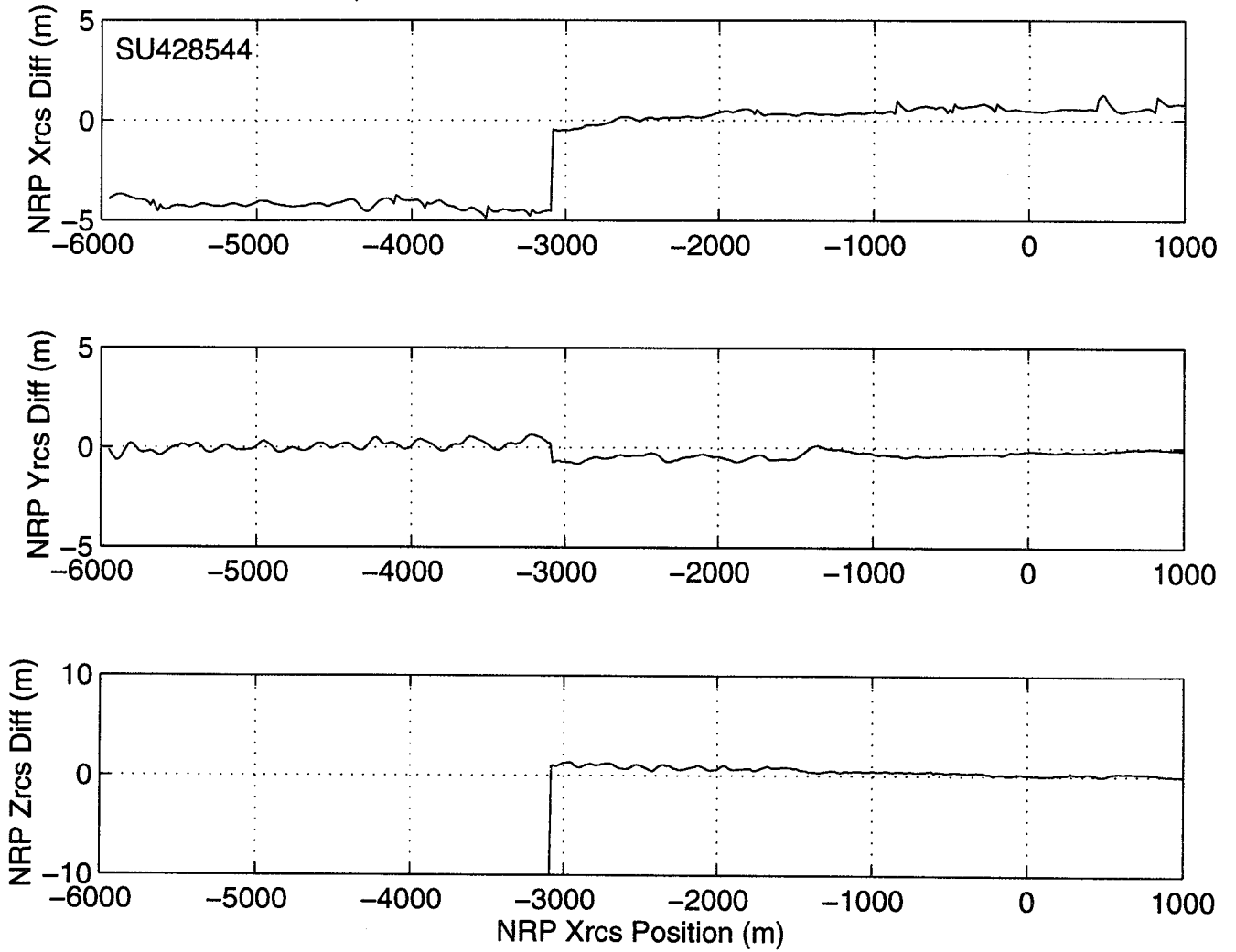
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428546
START TIME: 331516.249
STOP TIME: 331627.999

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 3.0

MINIMUM VDOP: 9.9
MAXIMUM VDOP: 10.1
AVERAGE VDOP: 10.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.589
NRP Yrcs MEAN DIFFERENCE (m): -0.176
NRP Zrcs MEAN DIFFERENCE (m): 0.071

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.364
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.211
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.215

NRP Xrcs 2-RMS DIFFERENCE (m): 1.233
NRP Yrcs 2-RMS DIFFERENCE (m): 0.410
NRP Zrcs 2-RMS DIFFERENCE (m): 0.257

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 92.407
LGRP Yrcs POSITION (m): 0.799

APPROACH #: SU428546
START TIME: 331516.249
STOP TIME: 331627.999

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 3.0

MINIMUM VDOP: 9.9
MAXIMUM VDOP: 10.1
AVERAGE VDOP: 10.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

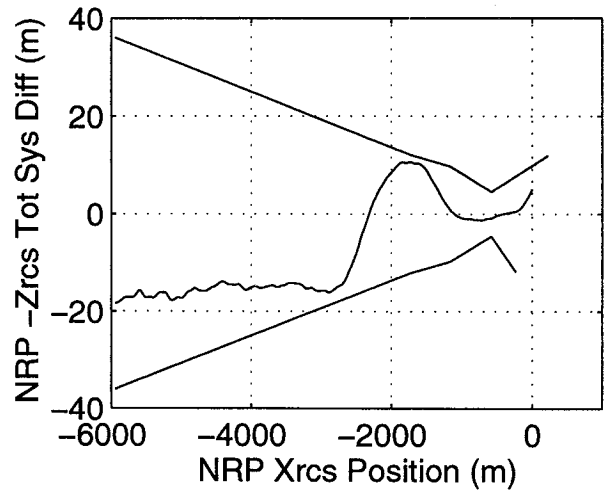
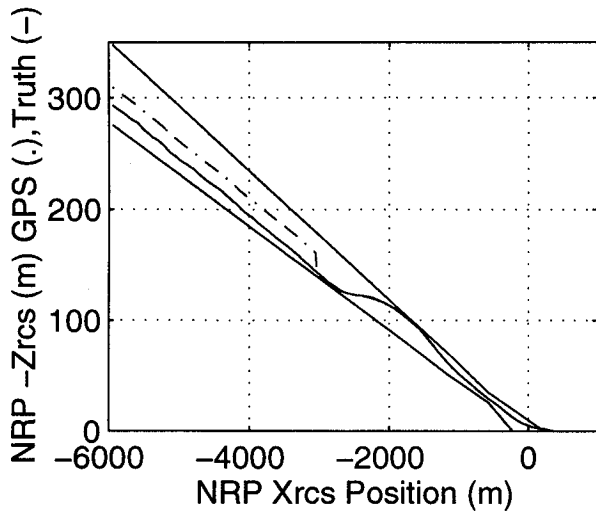
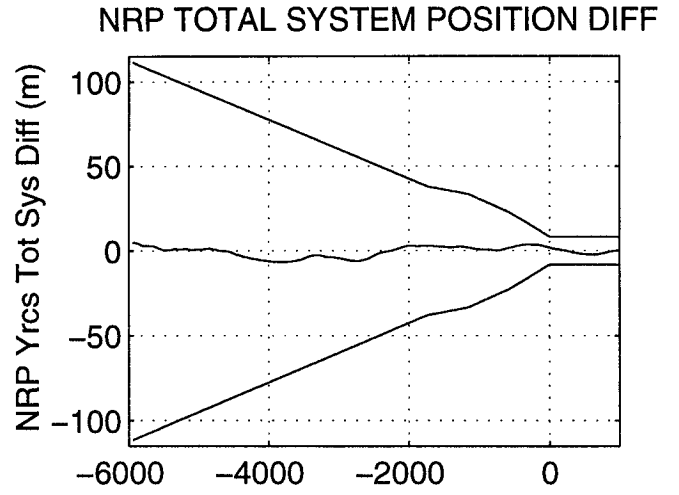
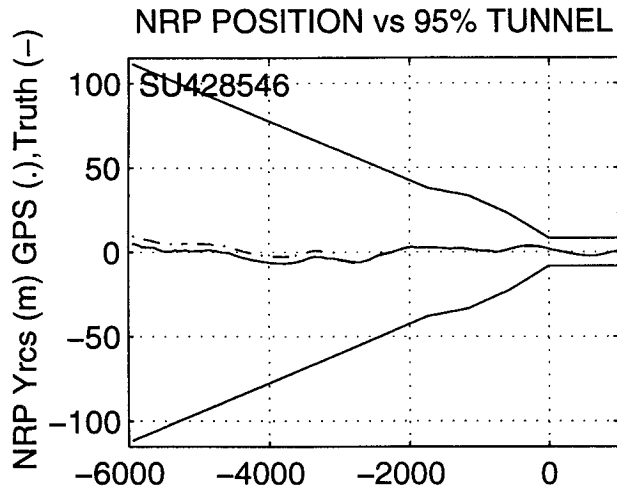
NRP Xrcs MEAN DIFFERENCE (m): 0.589
NRP Yrcs MEAN DIFFERENCE (m): -0.176
NRP Zrcs MEAN DIFFERENCE (m): 0.071

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.364
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.211
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.215

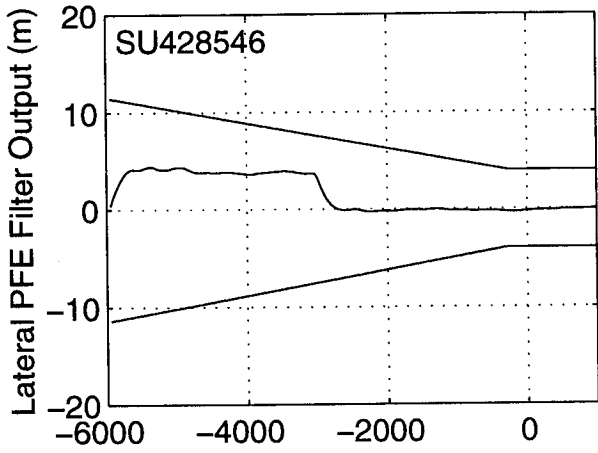
NRP Xrcs 2-RMS DIFFERENCE (m): 1.233
NRP Yrcs 2-RMS DIFFERENCE (m): 0.410
NRP Zrcs 2-RMS DIFFERENCE (m): 0.257

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

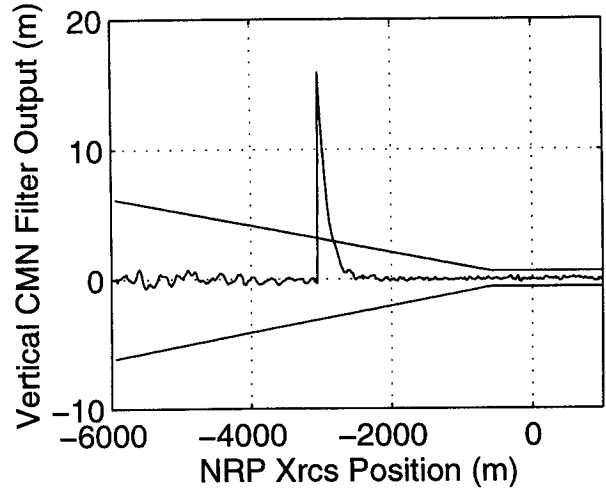
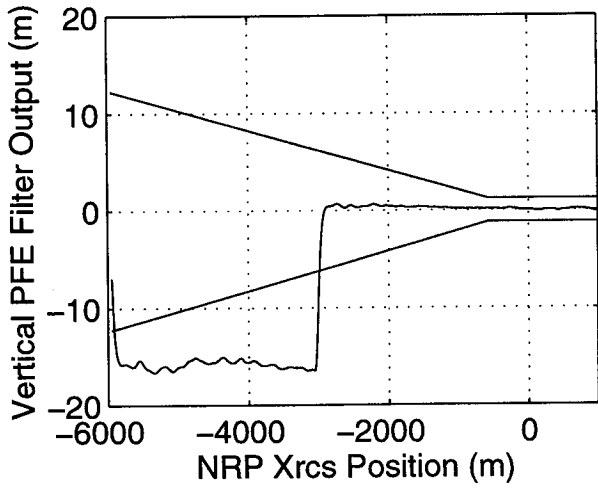
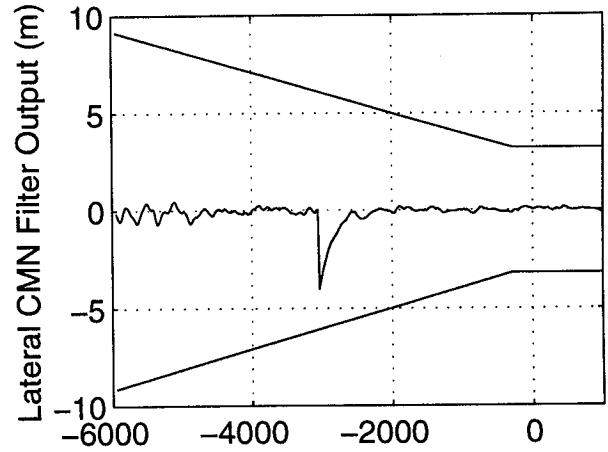
LGRP Xrcs POSITION (m): 92.407
LGRP Yrcs POSITION (m): 0.799



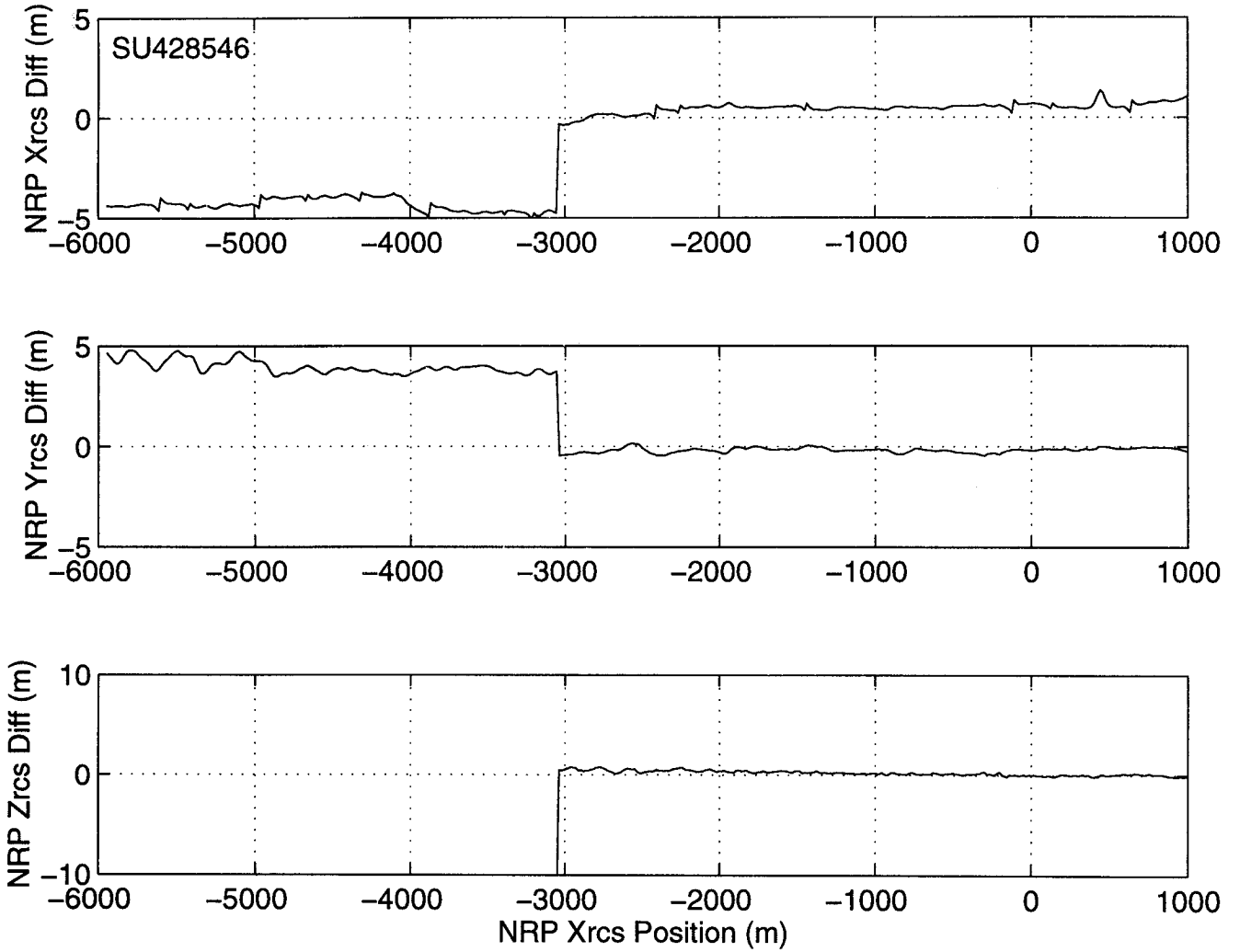
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428548
START TIME: 331939.499
STOP TIME: 332048.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 8.9
MAXIMUM VDOP: 9.2
AVERAGE VDOP: 9.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.522
NRP Yrcs MEAN DIFFERENCE (m): -0.176
NRP Zrcs MEAN DIFFERENCE (m): 0.087

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.398
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.183
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.259

NRP Xrcs 2-RMS DIFFERENCE (m): 1.117
NRP Yrcs 2-RMS DIFFERENCE (m): 0.397
NRP Zrcs 2-RMS DIFFERENCE (m): 0.312

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 138.640
LGRP Yrcs POSITION (m): 0.571

APPROACH #: SU428548
START TIME: 331939.499
STOP TIME: 332048.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 8.9
MAXIMUM VDOP: 9.2
AVERAGE VDOP: 9.1

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

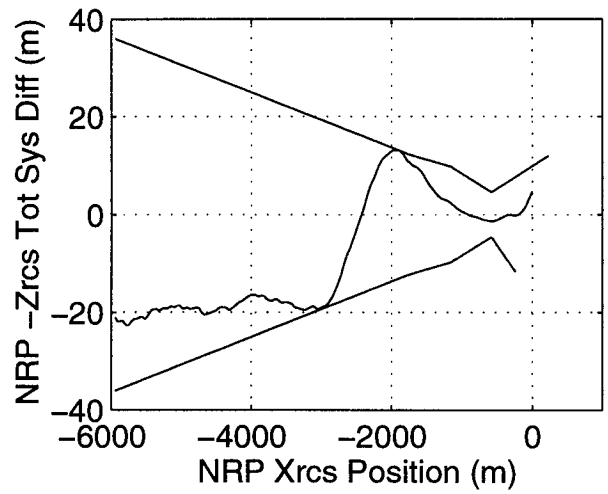
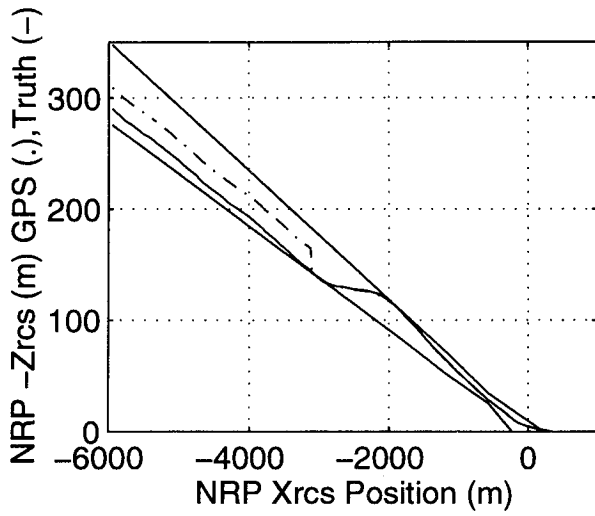
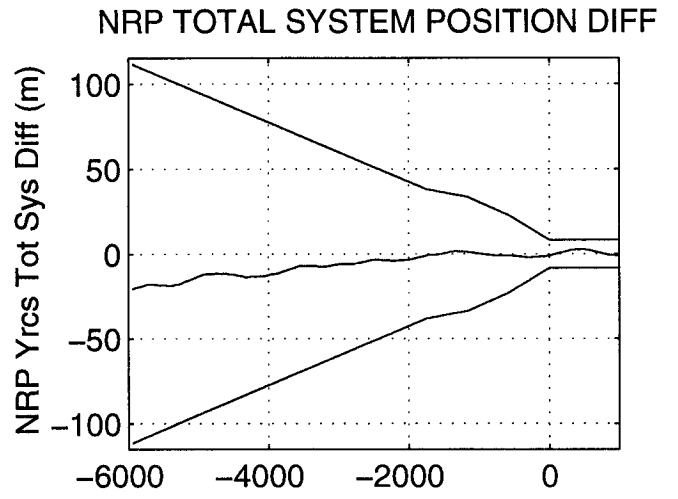
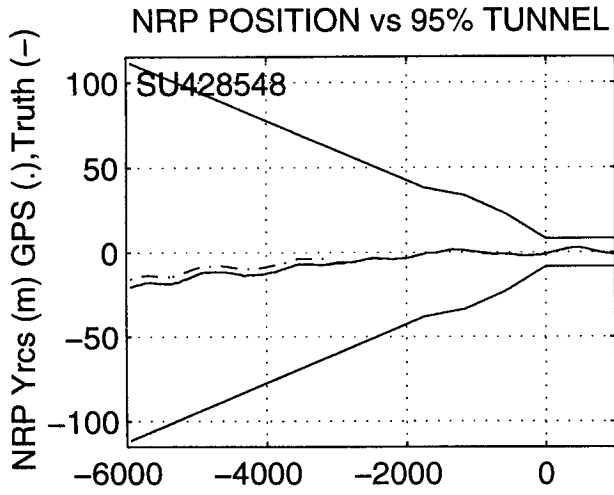
NRP Xrcs MEAN DIFFERENCE (m): 0.522
NRP Yrcs MEAN DIFFERENCE (m): -0.176
NRP Zrcs MEAN DIFFERENCE (m): 0.087

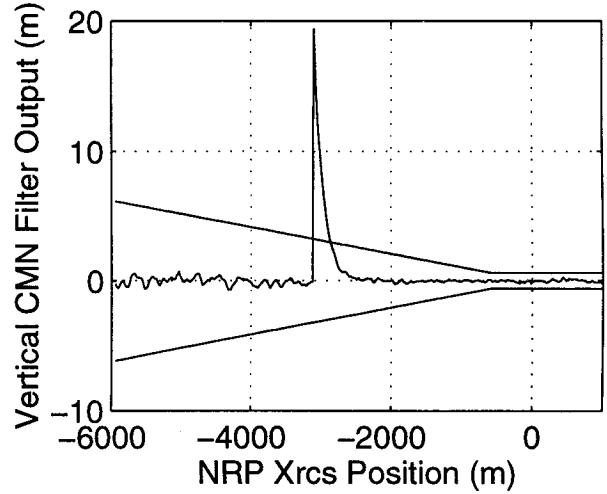
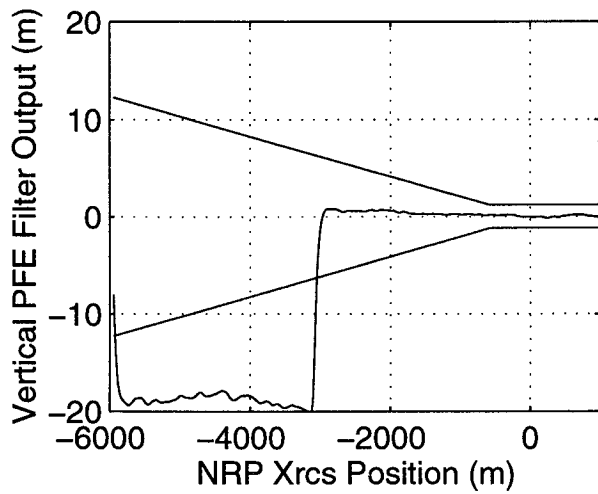
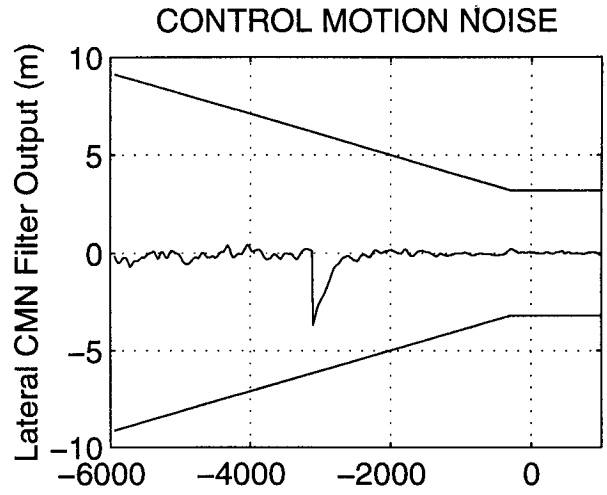
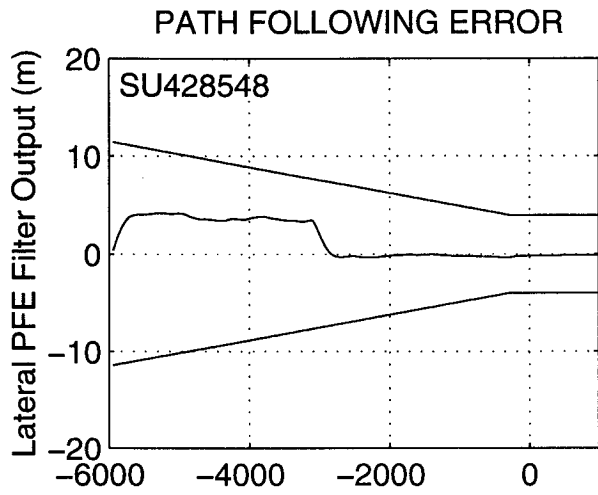
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.398
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.183
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.259

NRP Xrcs 2-RMS DIFFERENCE (m): 1.117
NRP Yrcs 2-RMS DIFFERENCE (m): 0.397
NRP Zrcs 2-RMS DIFFERENCE (m): 0.312

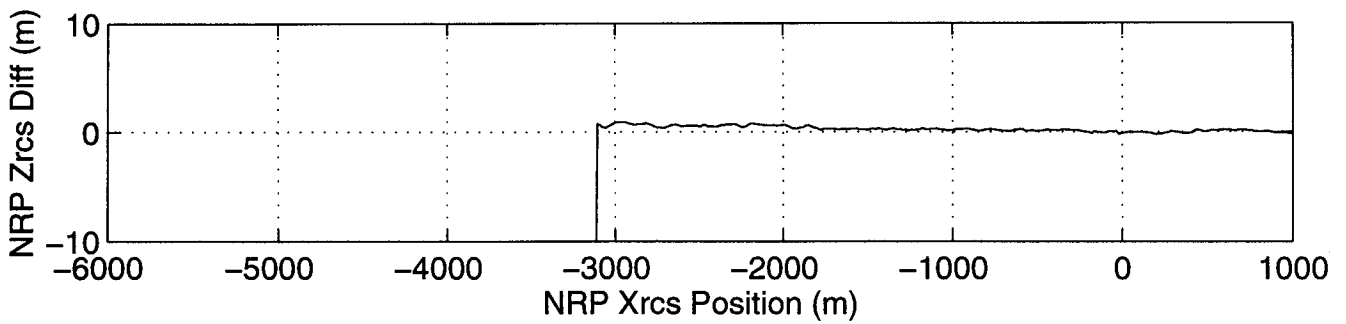
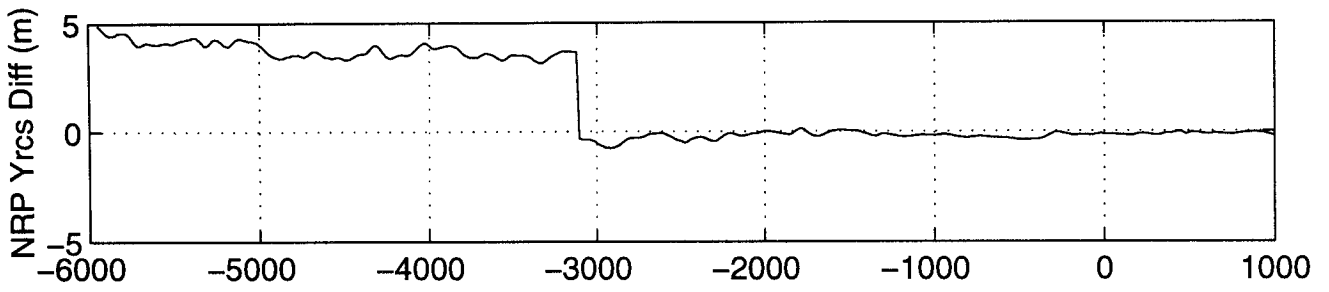
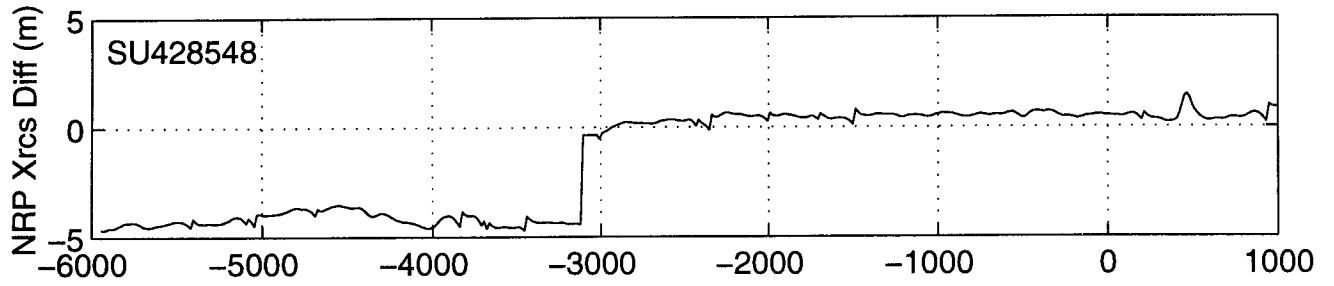
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 138.640
LGRP Yrcs POSITION (m): 0.571





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428550
START TIME: 332349.499
STOP TIME: 332459.249

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 7.8
MAXIMUM VDOP: 8.1
AVERAGE VDOP: 7.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.704
NRP Yrcs MEAN DIFFERENCE (m): -0.194
NRP Zrcs MEAN DIFFERENCE (m): 0.107

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.305
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.365
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.250

NRP Xrcs 2-RMS DIFFERENCE (m): 1.440
NRP Yrcs 2-RMS DIFFERENCE (m): 0.533
NRP Zrcs 2-RMS DIFFERENCE (m): 0.328

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 99.671
LGRP Yrcs POSITION (m): -2.033

APPROACH #: SU428550
START TIME: 332349.499
STOP TIME: 332459.249

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 7.8
MAXIMUM VDOP: 8.1
AVERAGE VDOP: 7.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

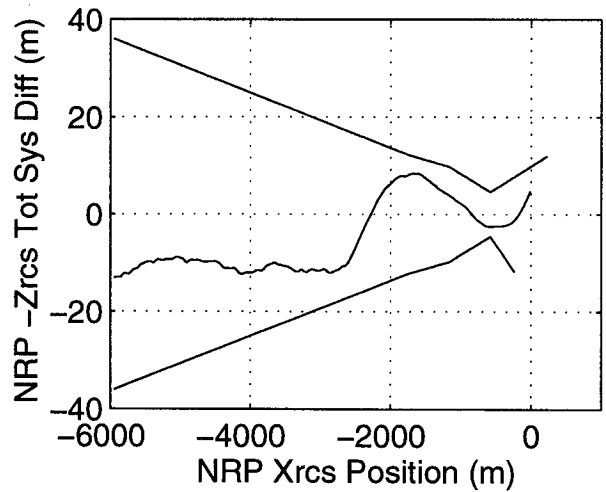
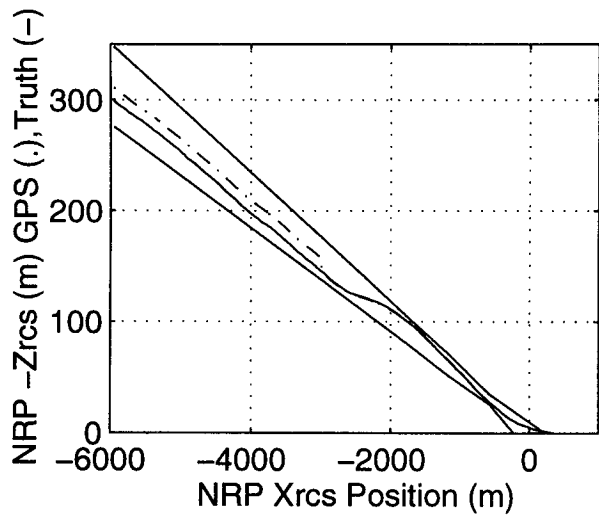
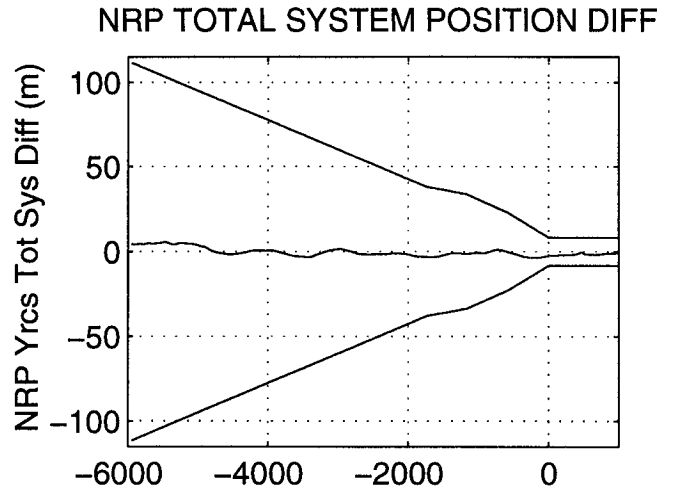
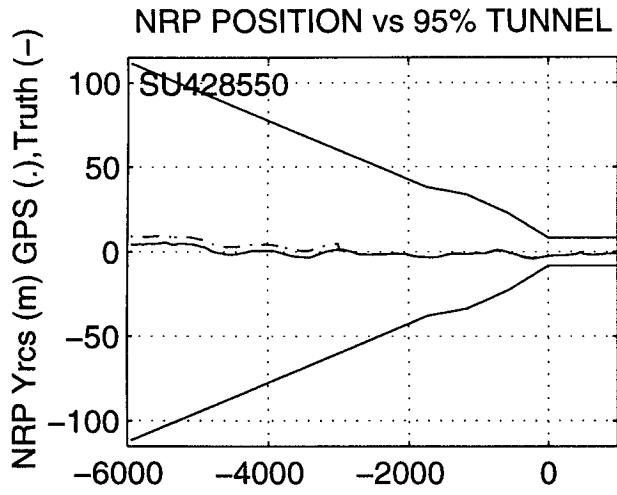
NRP Xrcs MEAN DIFFERENCE (m): 0.704
NRP Yrcs MEAN DIFFERENCE (m): -0.194
NRP Zrcs MEAN DIFFERENCE (m): 0.107

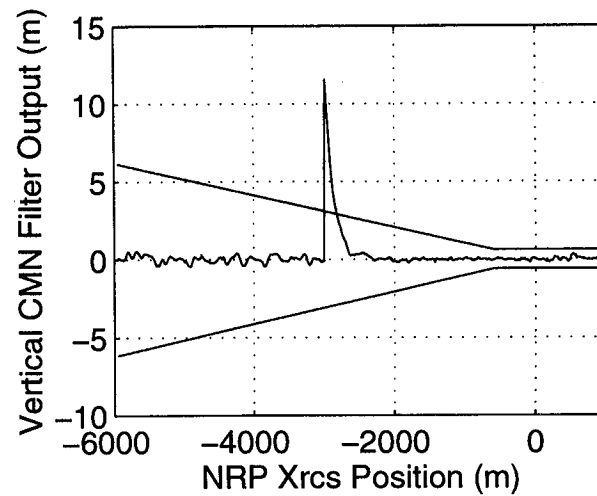
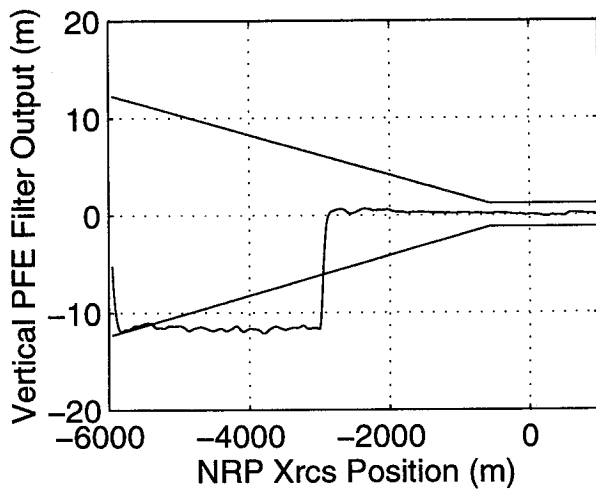
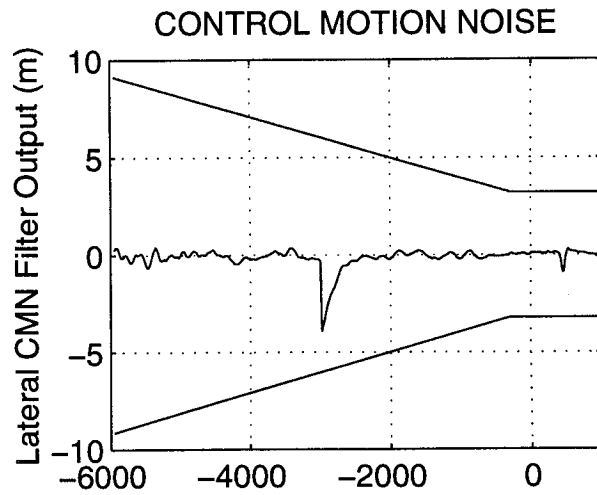
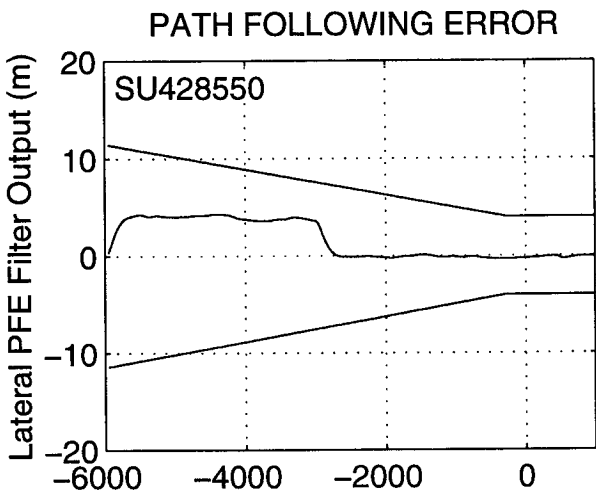
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.305
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.365
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.250

NRP Xrcs 2-RMS DIFFERENCE (m): 1.440
NRP Yrcs 2-RMS DIFFERENCE (m): 0.533
NRP Zrcs 2-RMS DIFFERENCE (m): 0.328

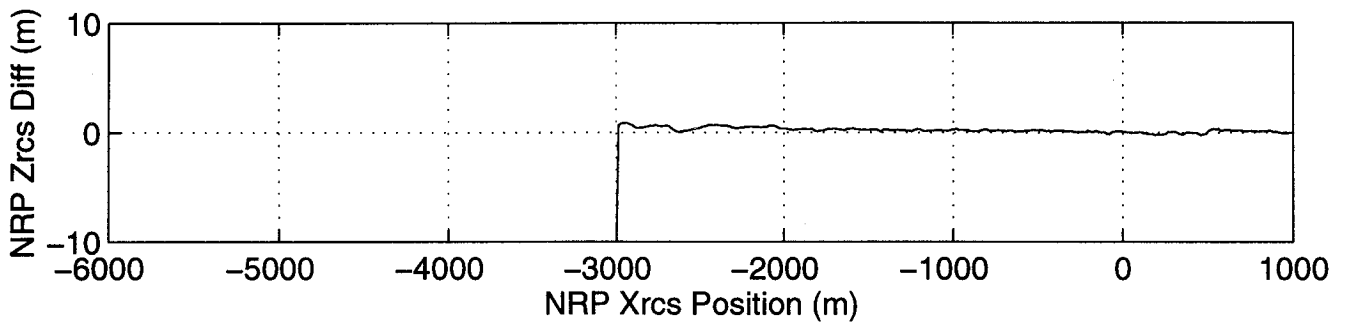
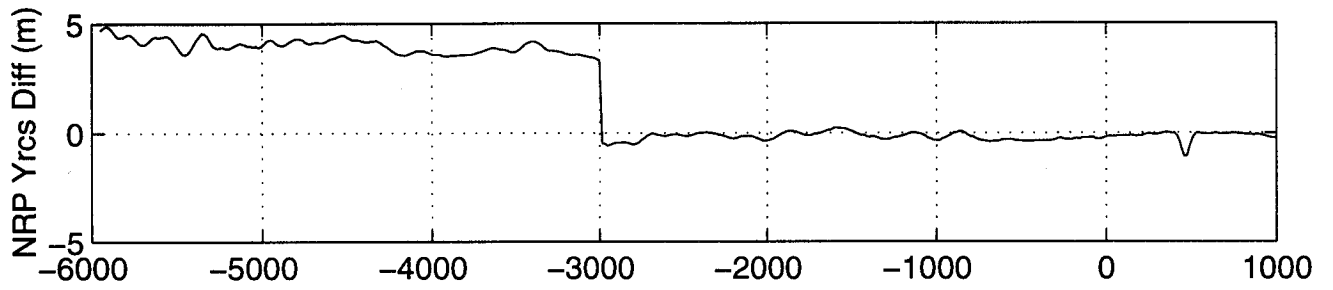
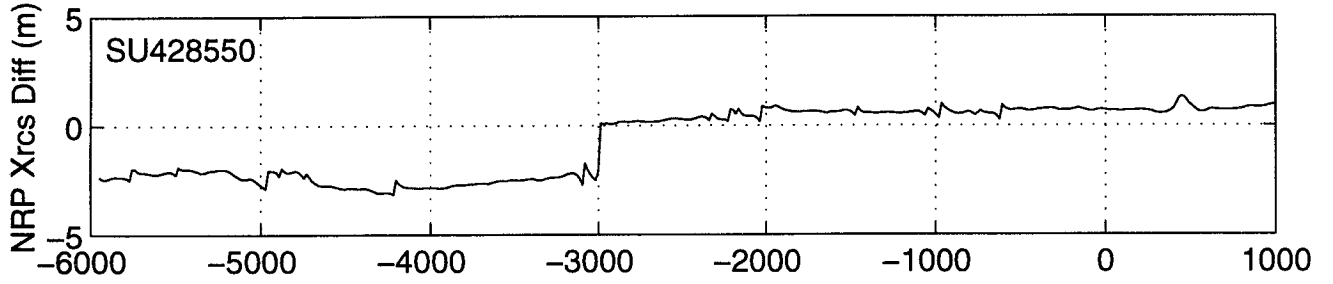
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 99.671
LGRP Yrcs POSITION (m): -2.033





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428552
START TIME: 332767.249
STOP TIME: 332880.249

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 6.6
MAXIMUM VDOP: 6.9
AVERAGE VDOP: 6.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.606
NRP Yrcs MEAN DIFFERENCE (m): -0.110
NRP Zrcs MEAN DIFFERENCE (m): -0.041

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.204
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.216
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.208

NRP Xrcs 2-RMS DIFFERENCE (m): 1.229
NRP Yrcs 2-RMS DIFFERENCE (m): 0.309
NRP Zrcs 2-RMS DIFFERENCE (m): 0.224

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 50.146
LGRP Yrcs POSITION (m): 1.617

APPROACH #: SU428552
START TIME: 332767.249
STOP TIME: 332880.249

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 6.6
MAXIMUM VDOP: 6.9
AVERAGE VDOP: 6.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

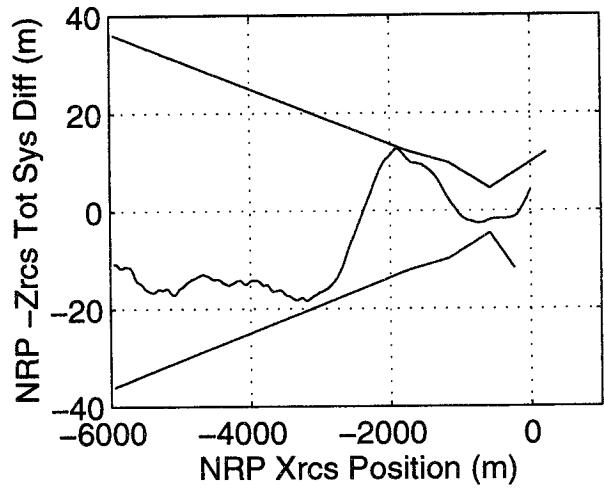
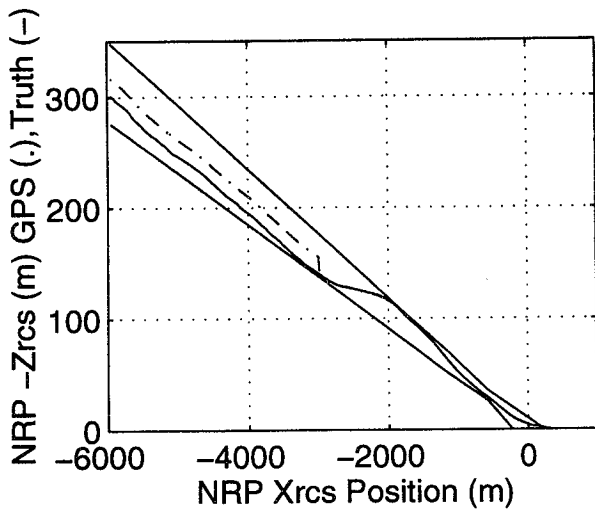
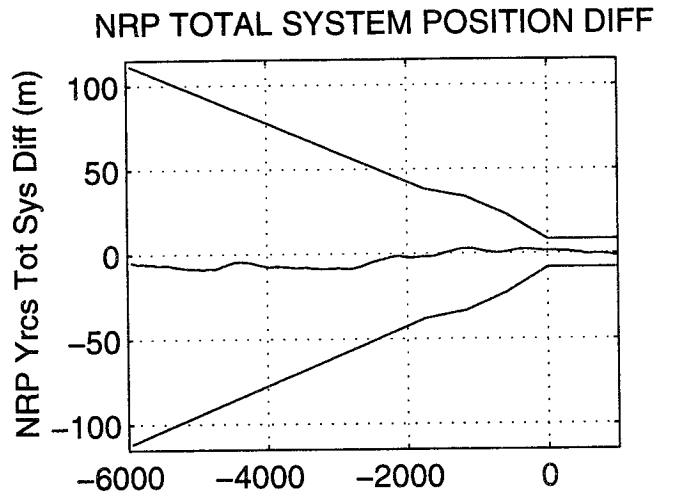
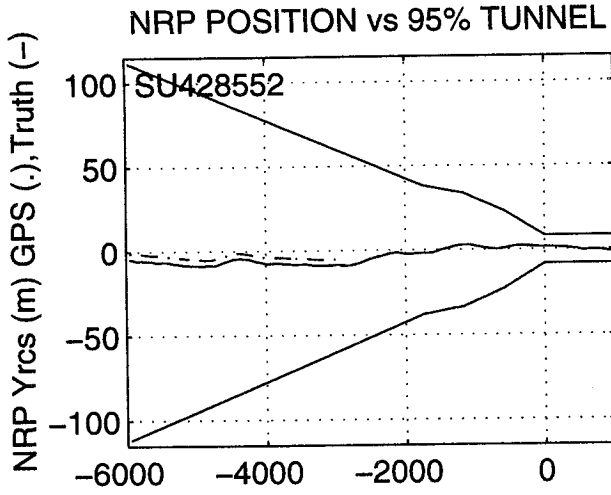
NRP Xrcs MEAN DIFFERENCE (m): 0.606
NRP Yrcs MEAN DIFFERENCE (m): -0.110
NRP Zrcs MEAN DIFFERENCE (m): -0.041

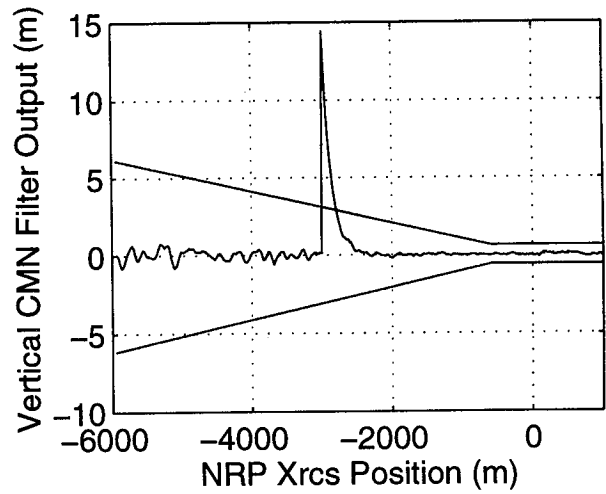
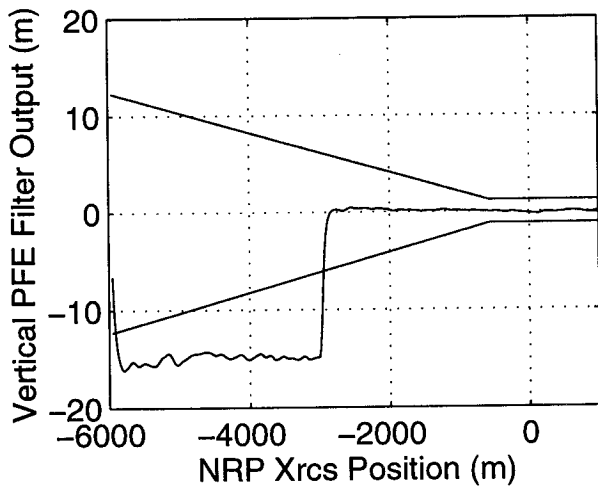
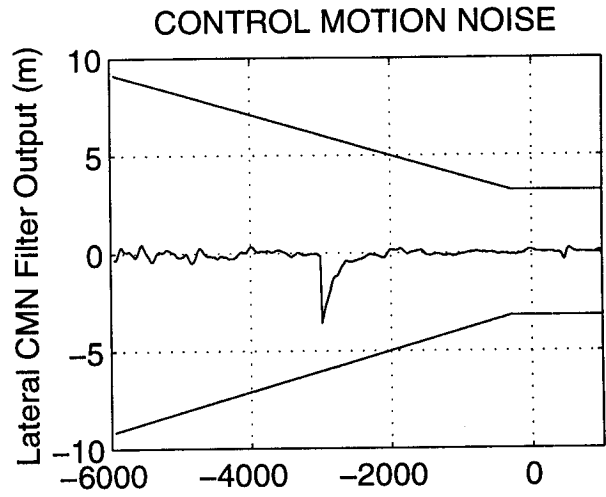
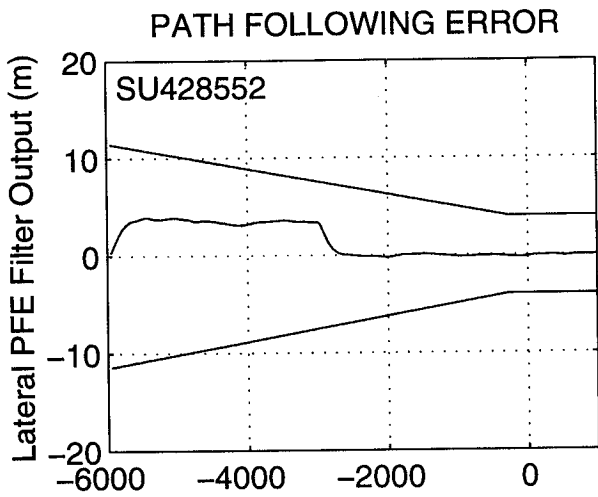
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.204
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.216
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.208

NRP Xrcs 2-RMS DIFFERENCE (m): 1.229
NRP Yrcs 2-RMS DIFFERENCE (m): 0.309
NRP Zrcs 2-RMS DIFFERENCE (m): 0.224

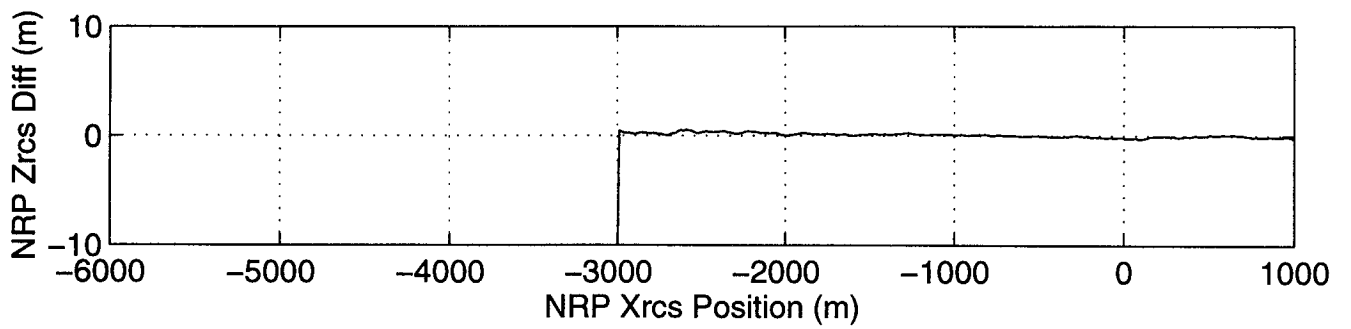
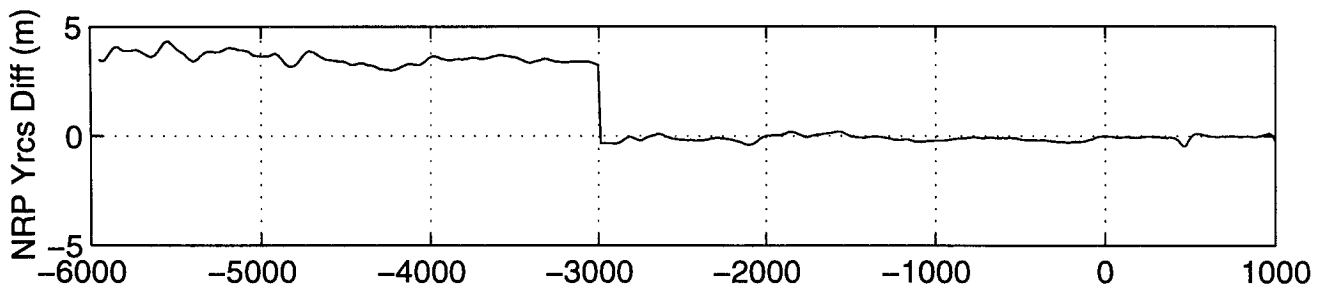
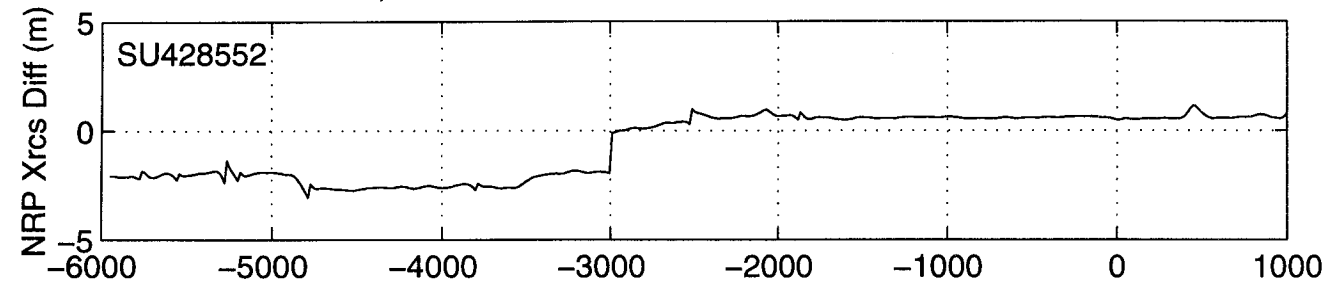
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 50.146
LGRP Yrcs POSITION (m): 1.617





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428554
START TIME: 333178.499
STOP TIME: 333291.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.8
AVERAGE VDOP: 5.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.590
NRP Yrcs MEAN DIFFERENCE (m): -0.074
NRP Zrcs MEAN DIFFERENCE (m): 0.005

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.219
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.176
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.236

NRP Xrcs 2-RMS DIFFERENCE (m): 1.200
NRP Yrcs 2-RMS DIFFERENCE (m): 0.230
NRP Zrcs 2-RMS DIFFERENCE (m): 0.236

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 185.309
LGRP Yrcs POSITION (m): -1.307

APPROACH #: SU428554
START TIME: 333178.499
STOP TIME: 333291.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.8
AVERAGE VDOP: 5.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

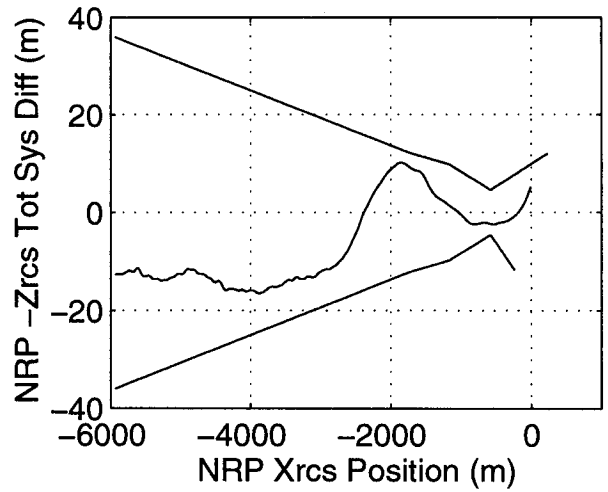
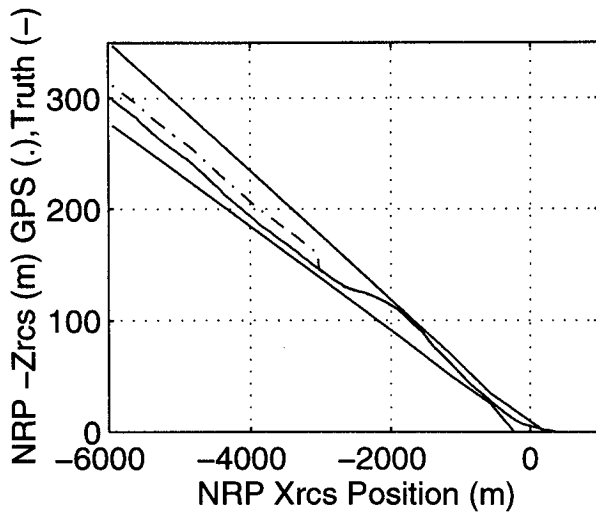
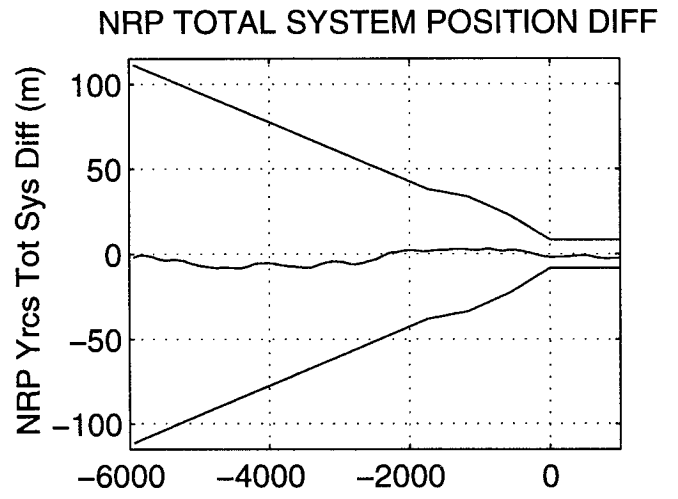
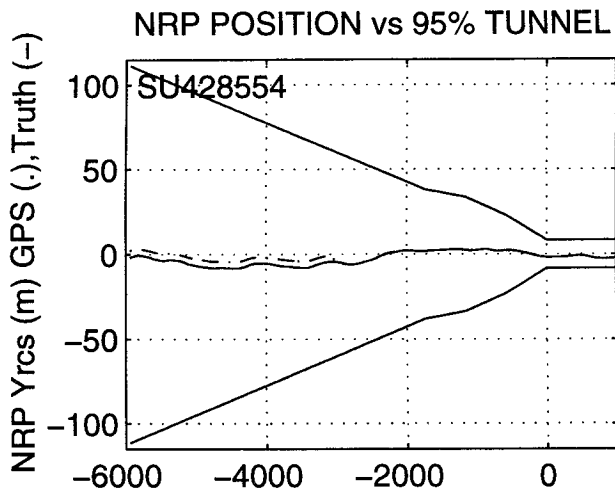
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NRP Yrcs MEAN DIFFERENCE (m): -0.074
NRP Zrcs MEAN DIFFERENCE (m): 0.005

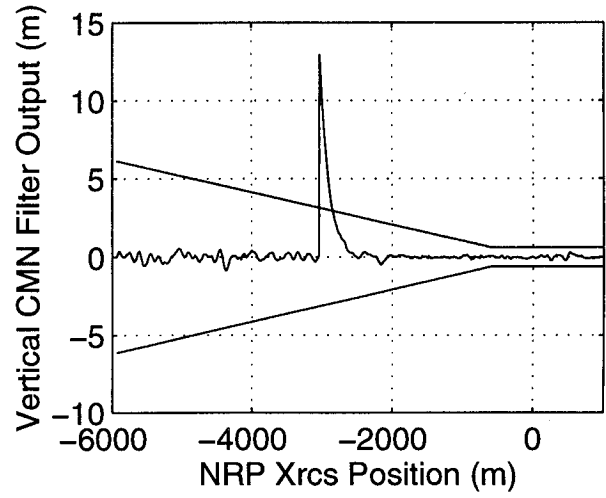
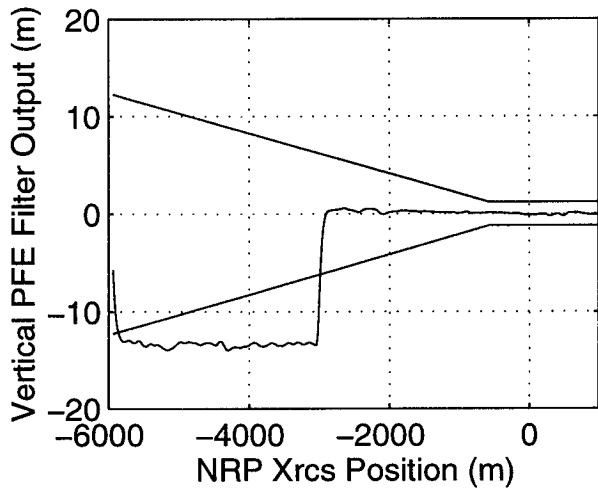
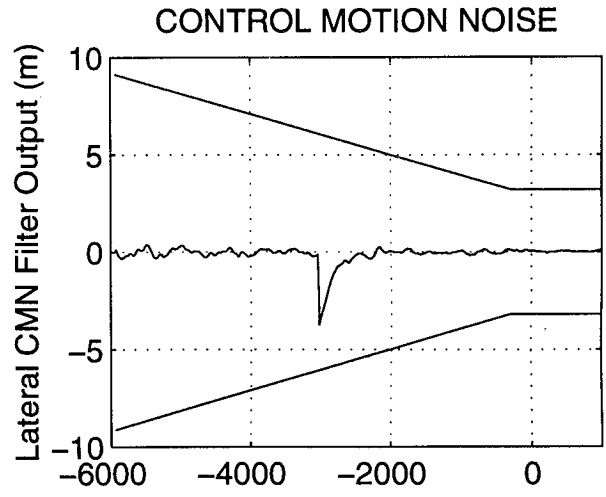
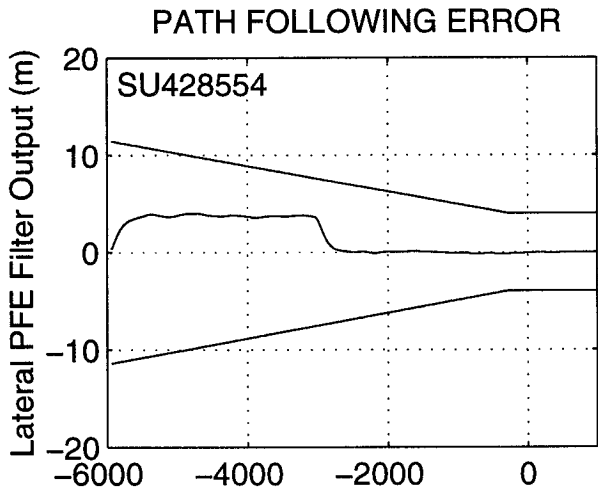
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.219
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.176
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.236

NRP Xrcs 2-RMS DIFFERENCE (m): 1.200
NRP Yrcs 2-RMS DIFFERENCE (m): 0.230
NRP Zrcs 2-RMS DIFFERENCE (m): 0.236

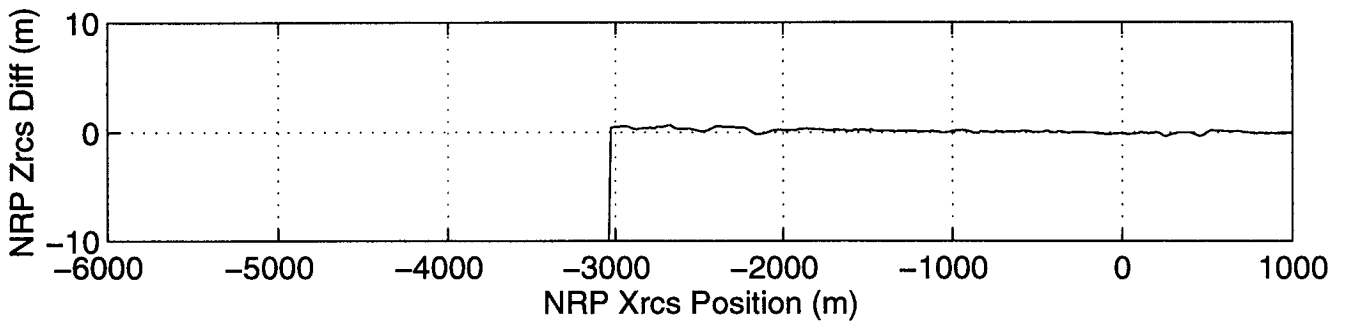
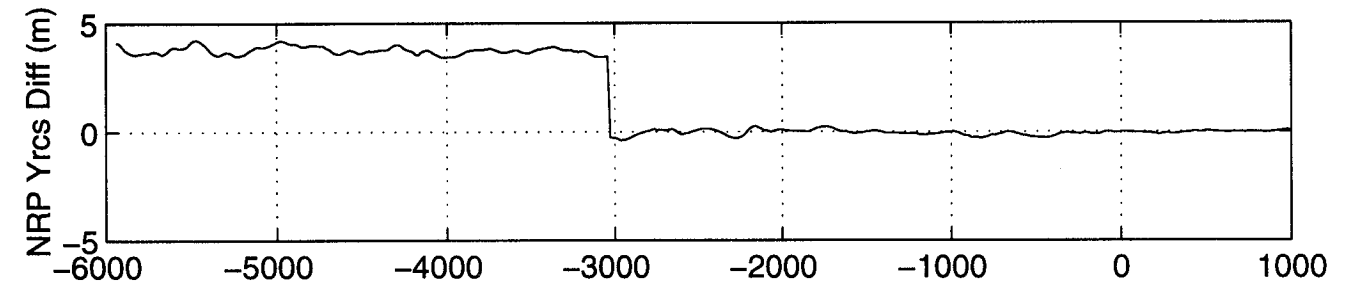
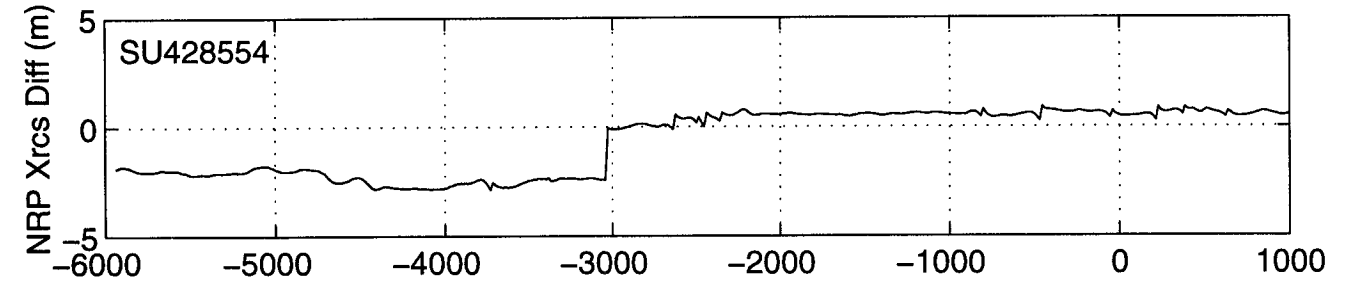
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 185.309
LGRP Yrcs POSITION (m): -1.307





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428556
START TIME: 333576.999
STOP TIME: 333689.999

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 5.0
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.691
NRP Yrcs MEAN DIFFERENCE (m): -0.139
NRP Zrcs MEAN DIFFERENCE (m): -0.048

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.341
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.283
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.185

NRP Xrcs 2-RMS DIFFERENCE (m): 1.424
NRP Yrcs 2-RMS DIFFERENCE (m): 0.396
NRP Zrcs 2-RMS DIFFERENCE (m): 0.209

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 229.468
LGRP Yrcs POSITION (m): -1.694

APPROACH #: SU428556
START TIME: 333576.999
STOP TIME: 333689.999

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 5.0
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

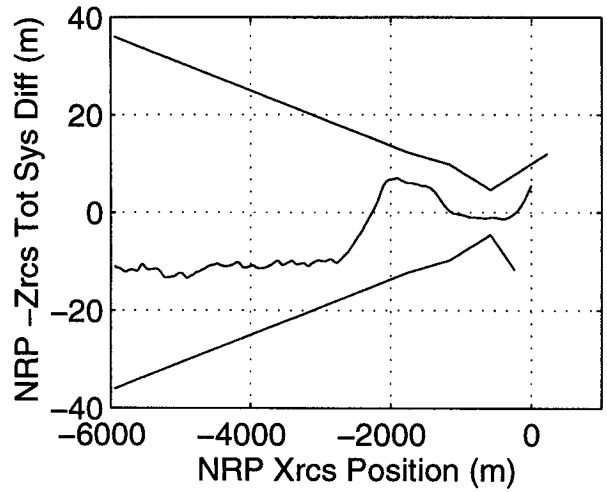
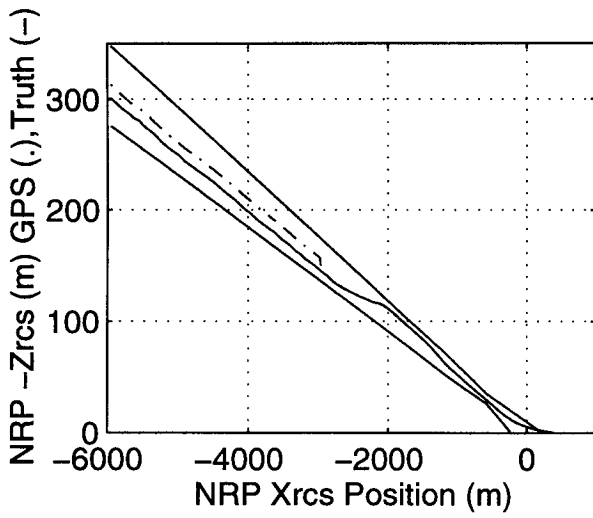
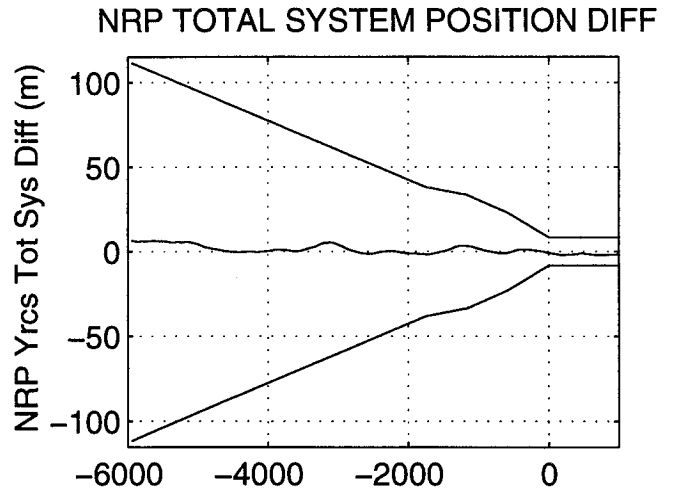
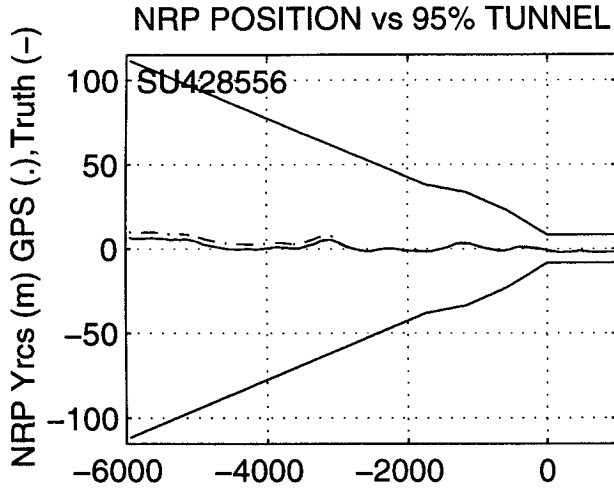
NRP Xrcs MEAN DIFFERENCE (m): 0.691
NRP Yrcs MEAN DIFFERENCE (m): -0.139
NRP Zrcs MEAN DIFFERENCE (m): -0.048

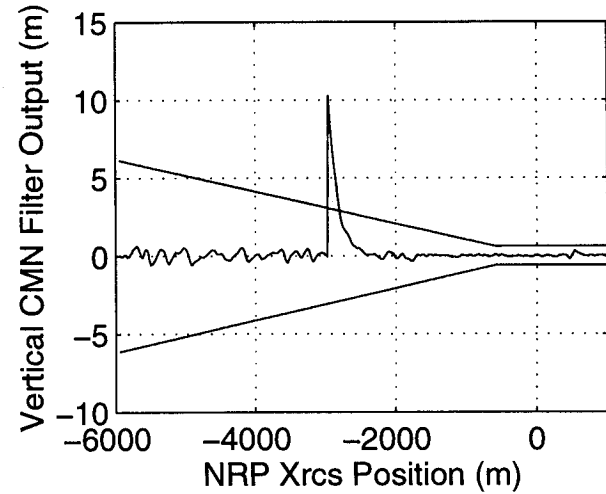
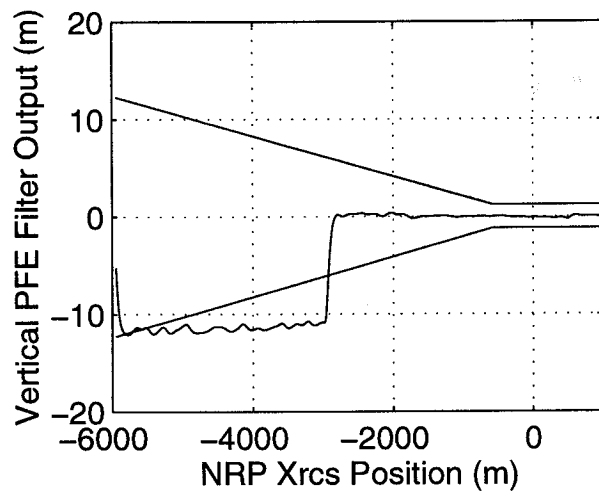
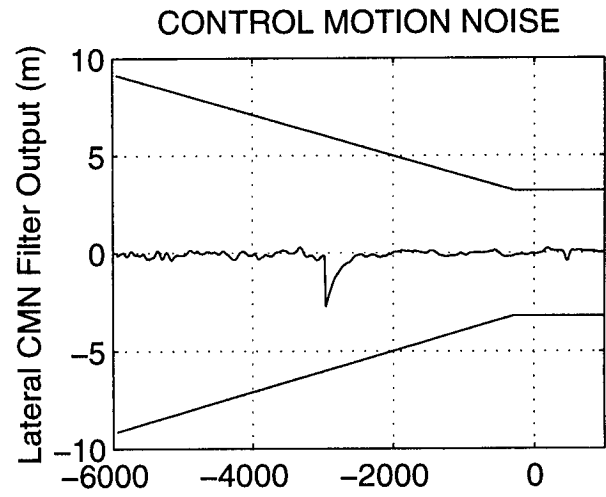
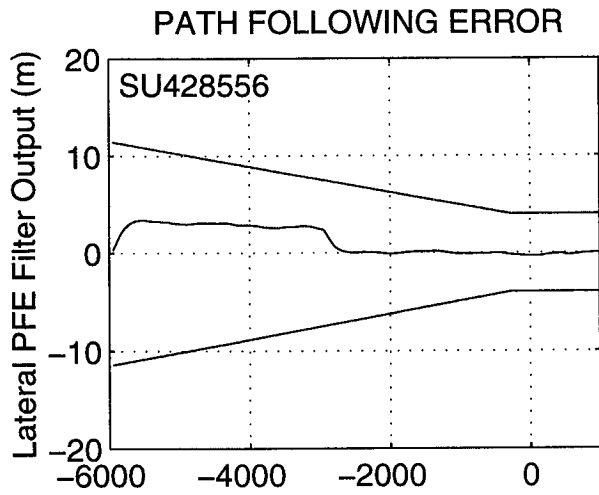
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.341
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.283
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.185

NRP Xrcs 2-RMS DIFFERENCE (m): 1.424
NRP Yrcs 2-RMS DIFFERENCE (m): 0.396
NRP Zrcs 2-RMS DIFFERENCE (m): 0.209

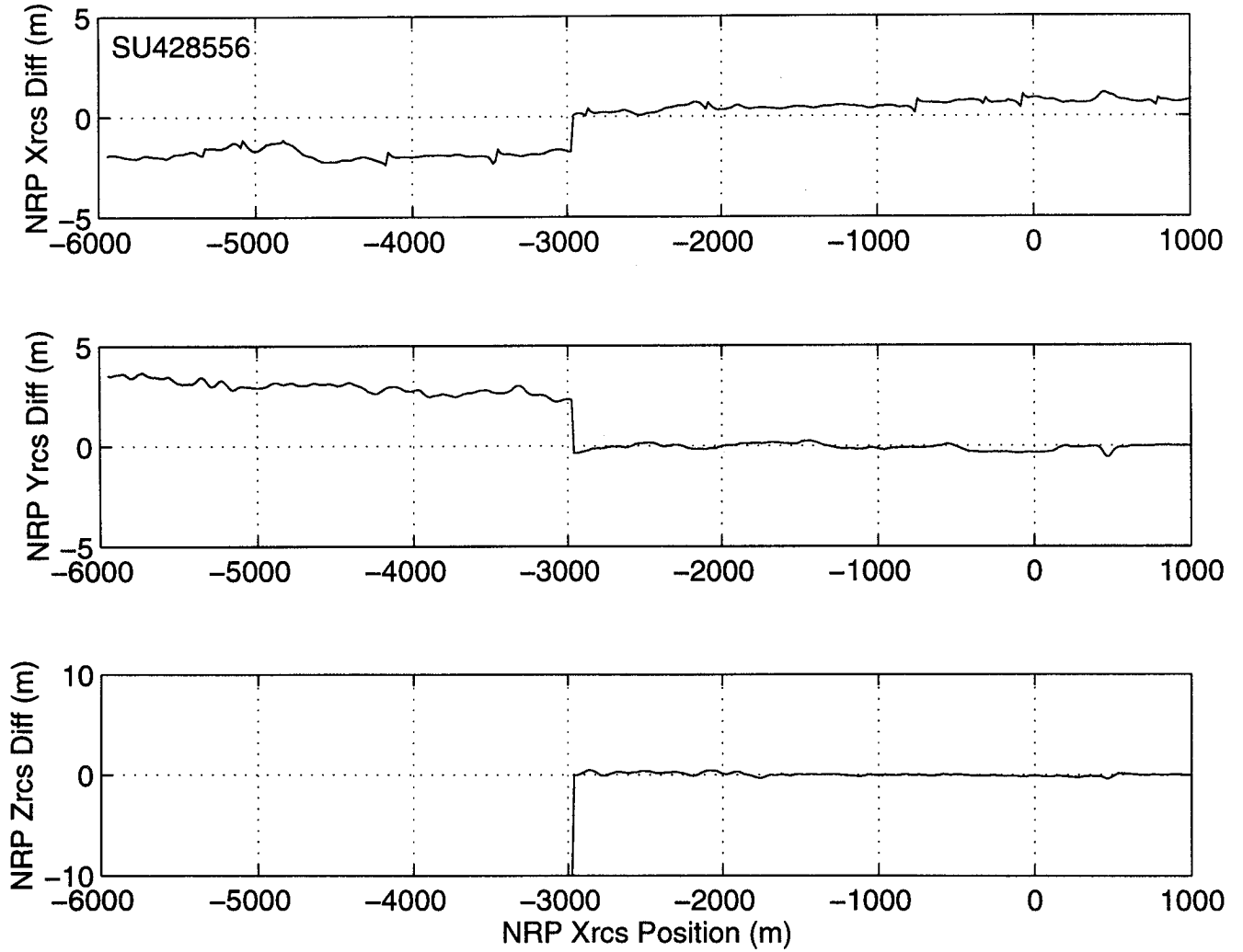
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 229.468
LGRP Yrcs POSITION (m): -1.694





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428558
START TIME: 334010.499
STOP TIME: 334123.499

MINIMUM HDOP: 1.9
MAXIMUM HDOP: 2.0
AVERAGE HDOP: 1.9

MINIMUM VDOP: 3.6
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.753
NRP Yrcs MEAN DIFFERENCE (m): -0.101
NRP Zrcs MEAN DIFFERENCE (m): -0.014

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.349
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.231
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.194

NRP Xrcs 2-RMS DIFFERENCE (m): 1.546
NRP Yrcs 2-RMS DIFFERENCE (m): 0.307
NRP Zrcs 2-RMS DIFFERENCE (m): 0.196

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 240.821
LGRP Yrcs POSITION (m): -0.994

APPROACH #: SU428558
START TIME: 334010.499
STOP TIME: 334123.499

MINIMUM HDOP: 1.9
MAXIMUM HDOP: 2.0
AVERAGE HDOP: 1.9

MINIMUM VDOP: 3.6
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

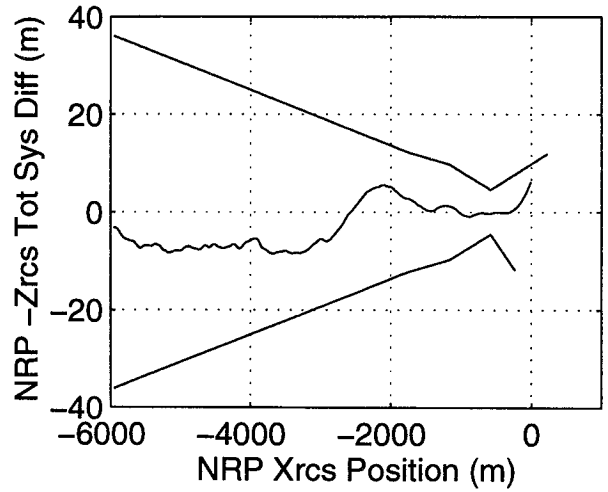
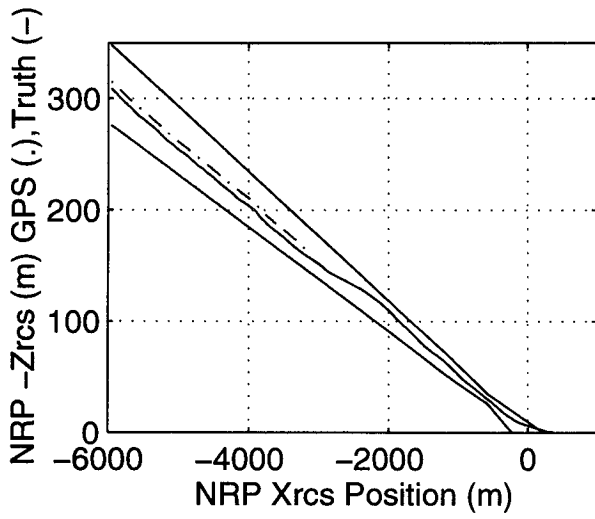
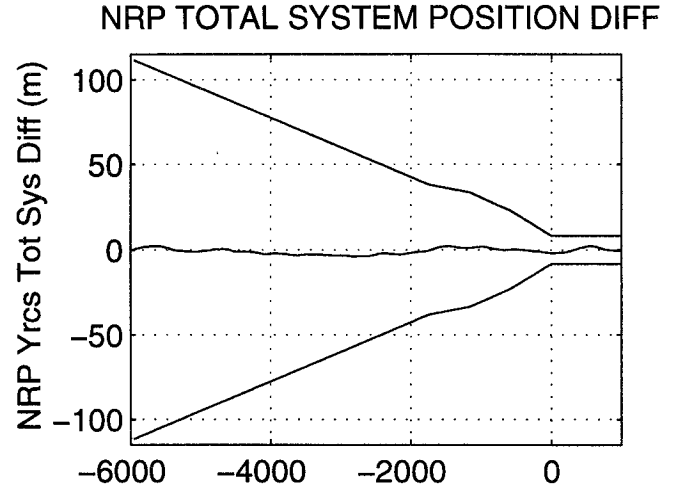
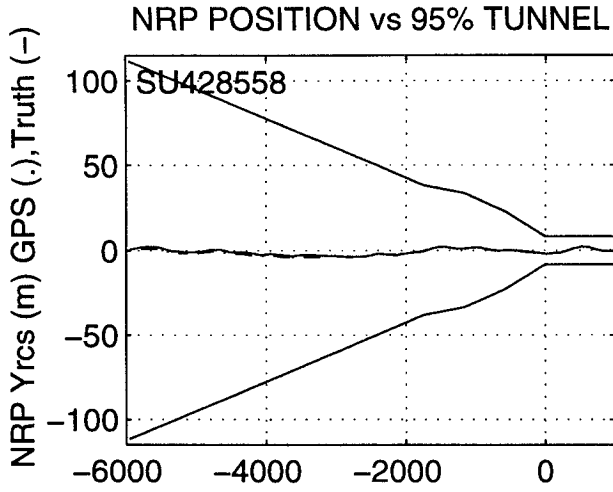
NRP Xrcs MEAN DIFFERENCE (m): 0.753
NRP Yrcs MEAN DIFFERENCE (m): -0.101
NRP Zrcs MEAN DIFFERENCE (m): -0.014

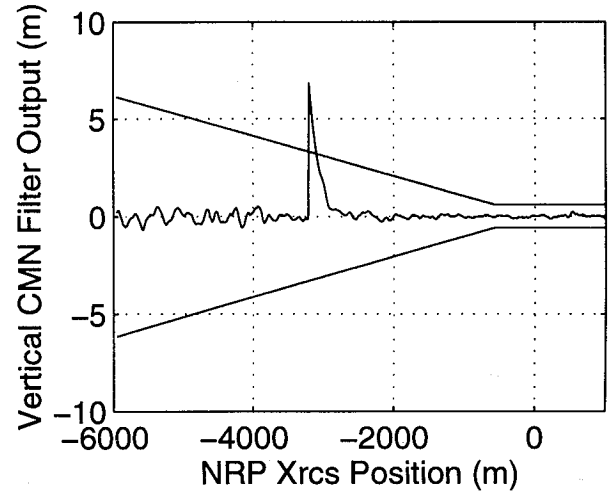
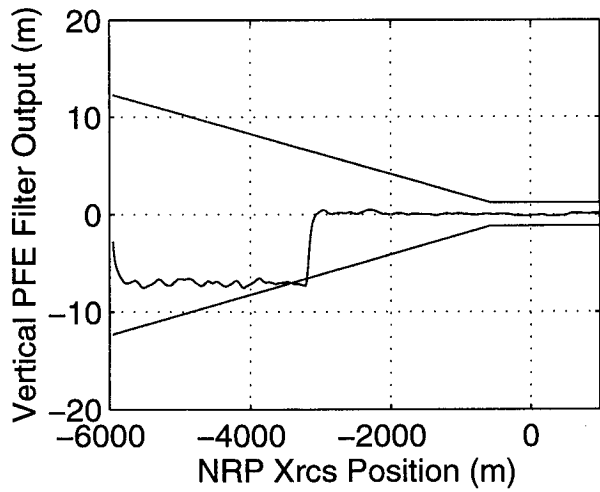
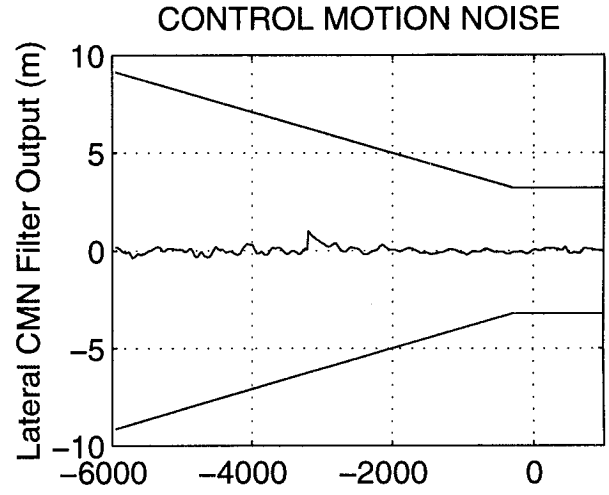
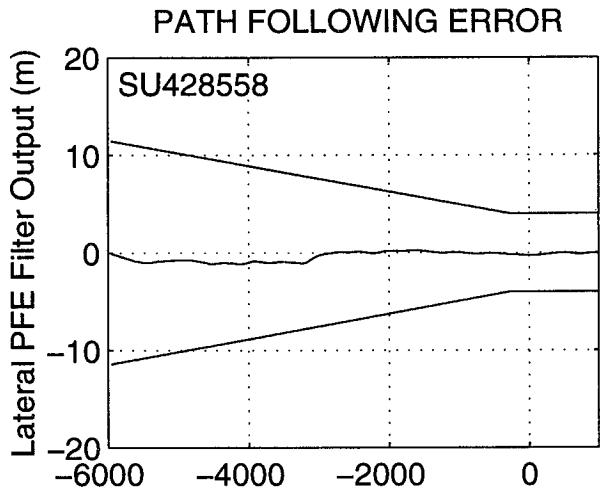
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.349
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.231
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.194

NRP Xrcs 2-RMS DIFFERENCE (m): 1.546
NRP Yrcs 2-RMS DIFFERENCE (m): 0.307
NRP Zrcs 2-RMS DIFFERENCE (m): 0.196

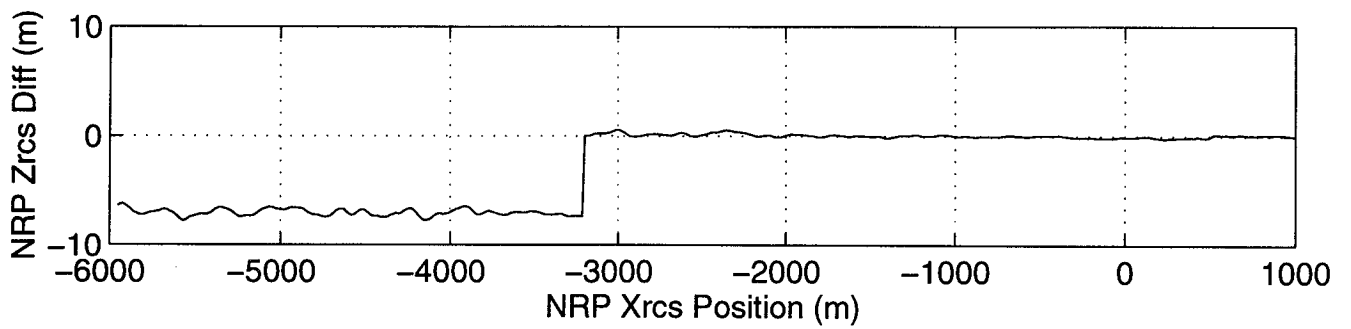
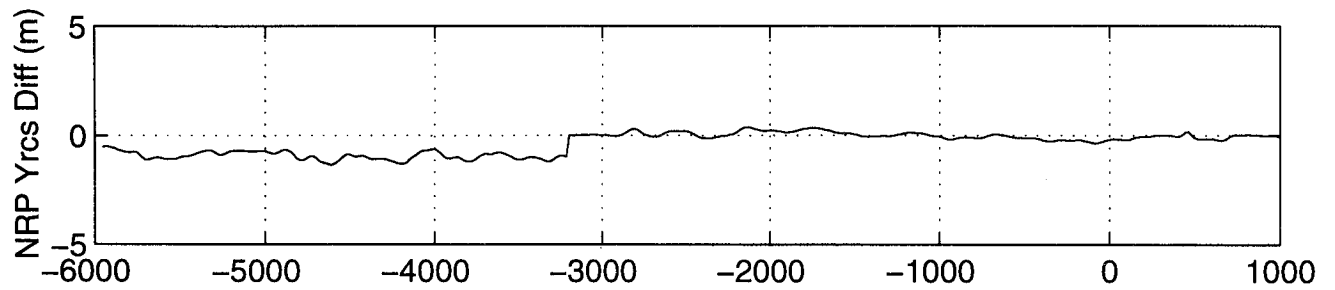
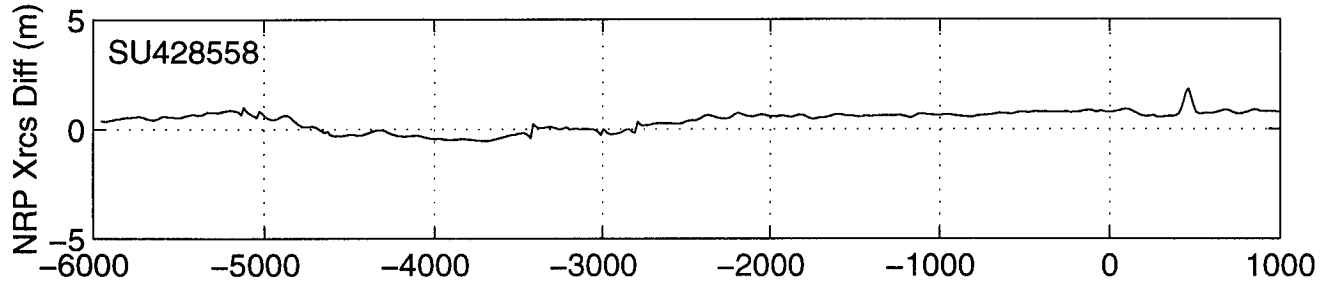
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 240.821
LGRP Yrcs POSITION (m): -0.994





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428560
START TIME: 334432.749
STOP TIME: 334545.249

MINIMUM HDOP: 2.1
MAXIMUM HDOP: 2.1
AVERAGE HDOP: 2.1

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.582
NRP Yrcs MEAN DIFFERENCE (m): -0.146
NRP Zrcs MEAN DIFFERENCE (m): -0.051

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.326
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.327
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.185

NRP Xrcs 2-RMS DIFFERENCE (m): 1.208
NRP Yrcs 2-RMS DIFFERENCE (m): 0.438
NRP Zrcs 2-RMS DIFFERENCE (m): 0.212

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 298.256
LGRP Yrcs POSITION (m): -0.887

APPROACH #: SU428560
START TIME: 334432.749
STOP TIME: 334545.249

MINIMUM HDOP: 2.1
MAXIMUM HDOP: 2.1
AVERAGE HDOP: 2.1

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

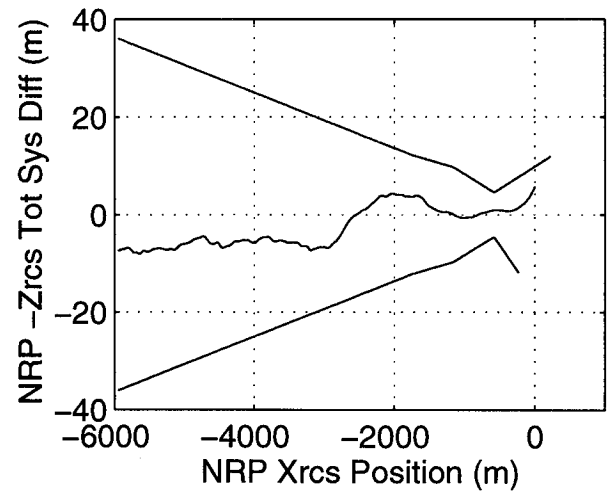
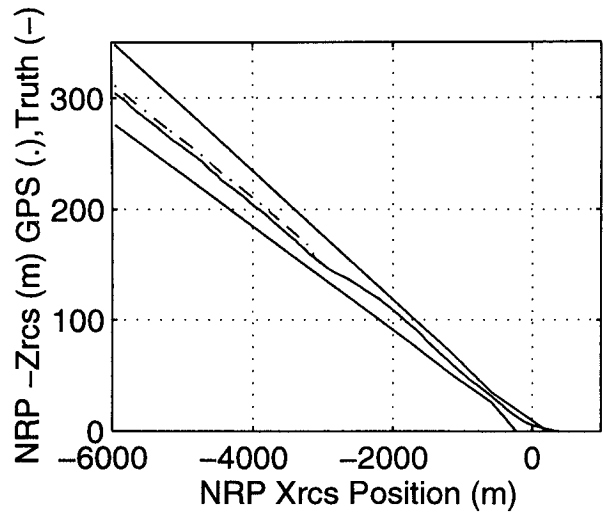
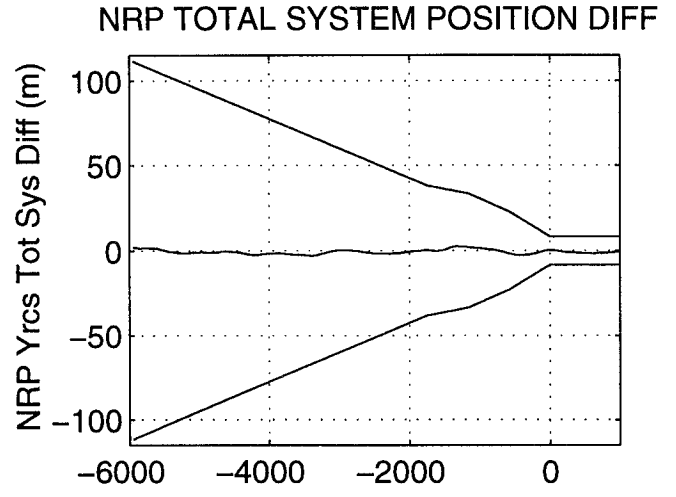
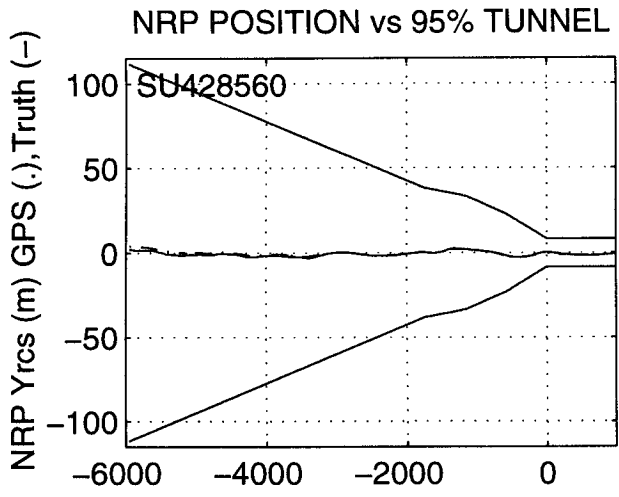
NRP Xrcs MEAN DIFFERENCE (m): 0.582
NRP Yrcs MEAN DIFFERENCE (m): -0.146
NRP Zrcs MEAN DIFFERENCE (m): -0.051

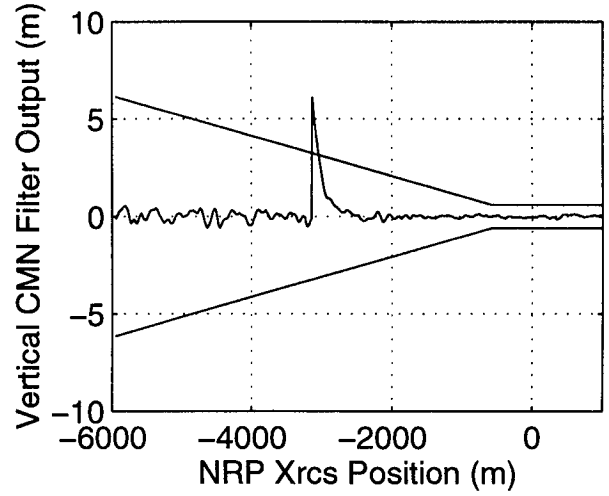
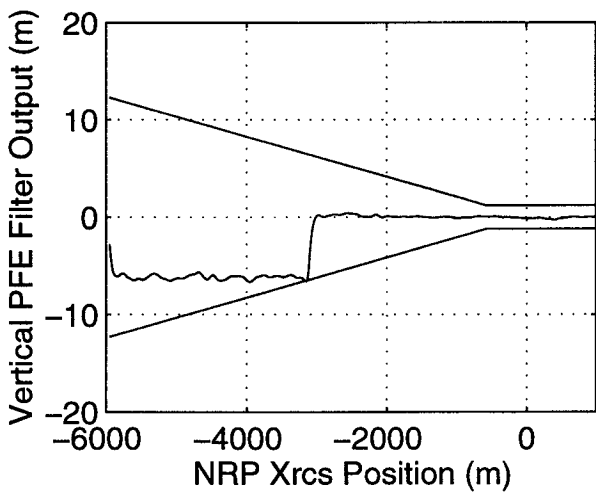
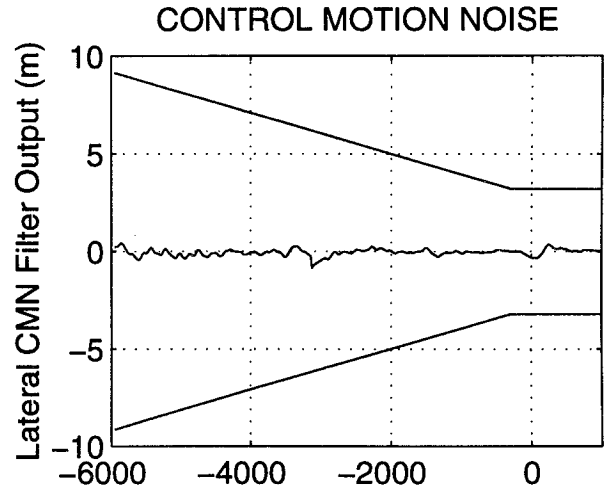
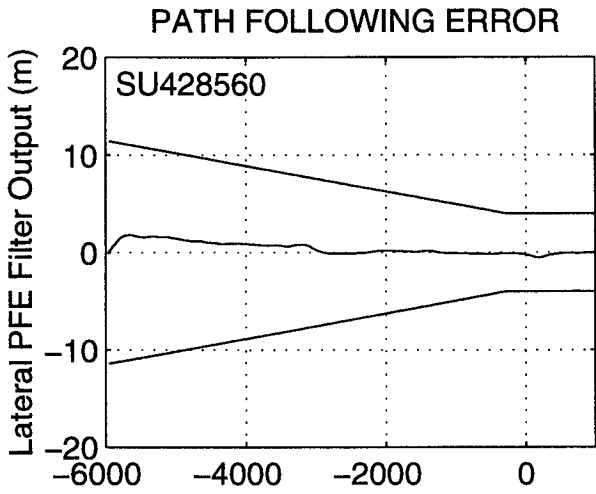
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.326
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.327
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.185

NRP Xrcs 2-RMS DIFFERENCE (m): 1.208
NRP Yrcs 2-RMS DIFFERENCE (m): 0.438
NRP Zrcs 2-RMS DIFFERENCE (m): 0.212

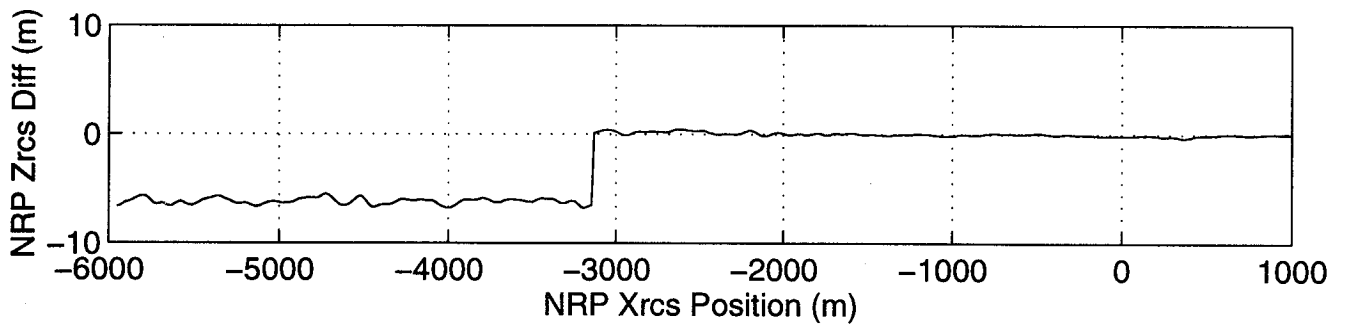
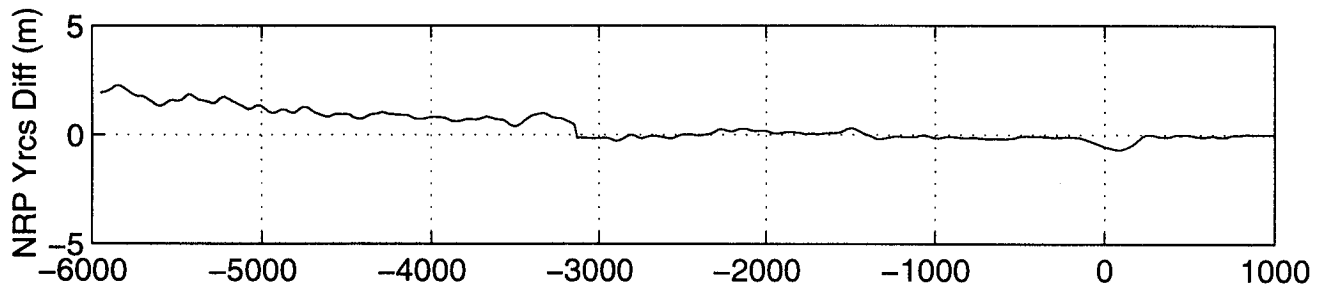
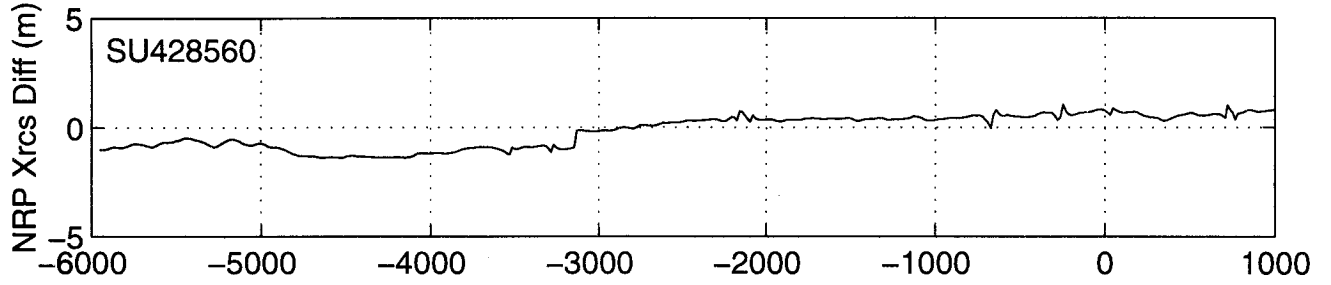
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 298.256
LGRP Yrcs POSITION (m): -0.887





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428562
START TIME: 334865.749
STOP TIME: 334987.249

MINIMUM HDOP: 5.2
MAXIMUM HDOP: 6.0
AVERAGE HDOP: 5.6

MINIMUM VDOP: 12.3
MAXIMUM VDOP: 14.7
AVERAGE VDOP: 13.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 3) DUE TO VIOLATION*
* OF THE VERTICAL TUNNEL BOUNDARY *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.603
NRP Yrcs MEAN DIFFERENCE (m): -0.107
NRP Zrcs MEAN DIFFERENCE (m): 0.001

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.297
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.275
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.215

NRP Xrcs 2-RMS DIFFERENCE (m): 1.243
NRP Yrcs 2-RMS DIFFERENCE (m): 0.348
NRP Zrcs 2-RMS DIFFERENCE (m): 0.215

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 74.498
LGRP Yrcs POSITION (m): 1.592

APPROACH #: SU428562
START TIME: 334865.749
STOP TIME: 334987.249

MINIMUM HDOP: 5.2
MAXIMUM HDOP: 6.0
AVERAGE HDOP: 5.6

MINIMUM VDOP: 12.3
MAXIMUM VDOP: 14.7
AVERAGE VDOP: 13.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

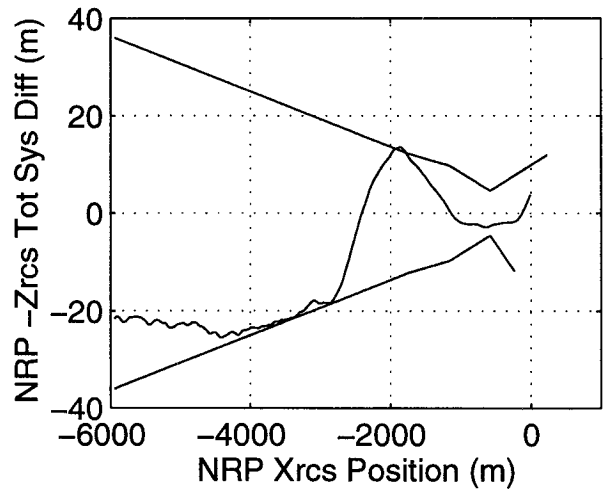
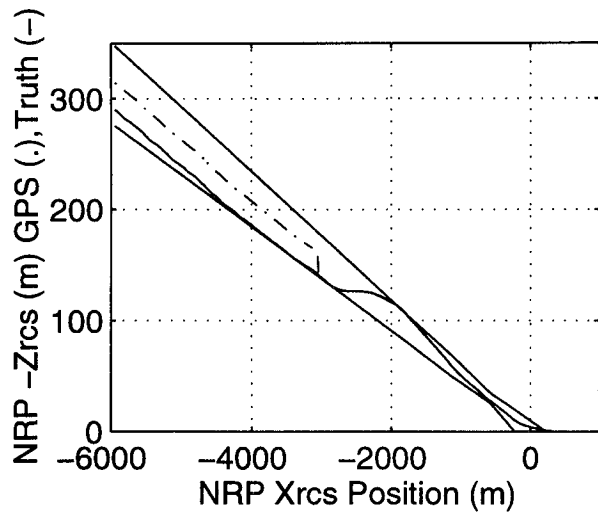
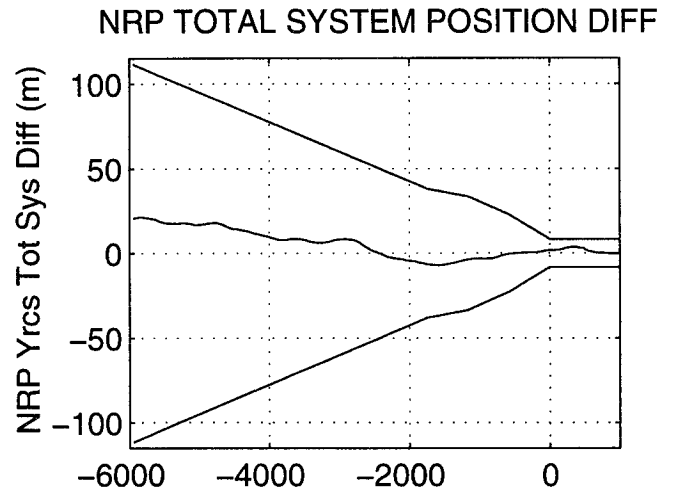
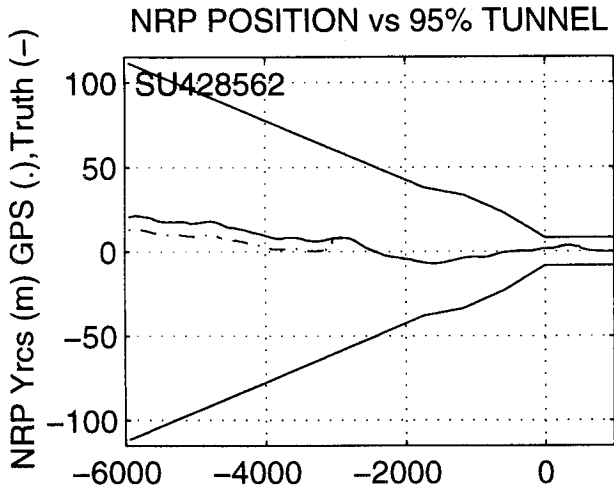
NRP Xrcs MEAN DIFFERENCE (m): 0.603
NRP Yrcs MEAN DIFFERENCE (m): -0.107
NRP Zrcs MEAN DIFFERENCE (m): 0.001

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.297
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.275
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.215

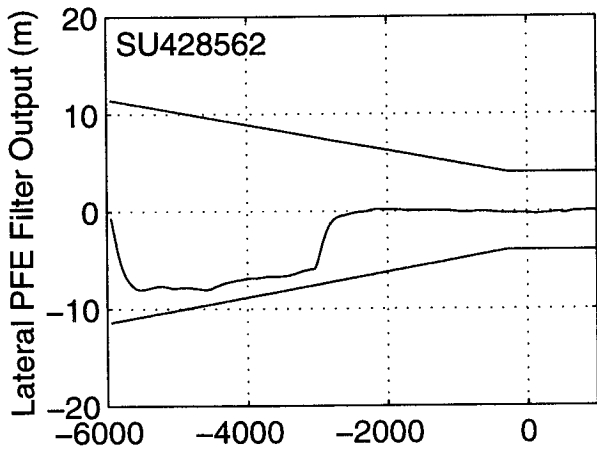
NRP Xrcs 2-RMS DIFFERENCE (m): 1.243
NRP Yrcs 2-RMS DIFFERENCE (m): 0.348
NRP Zrcs 2-RMS DIFFERENCE (m): 0.215

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

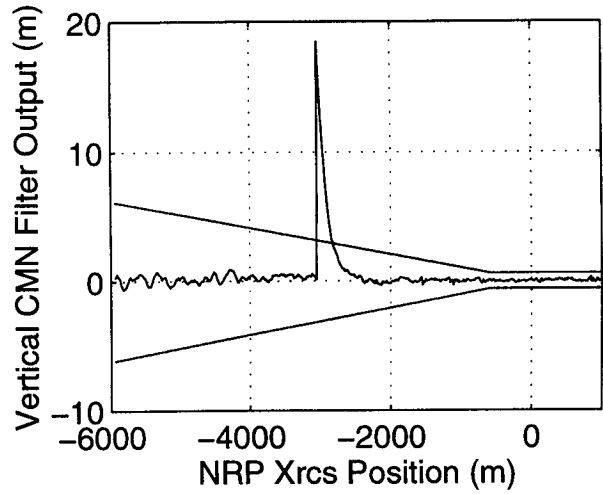
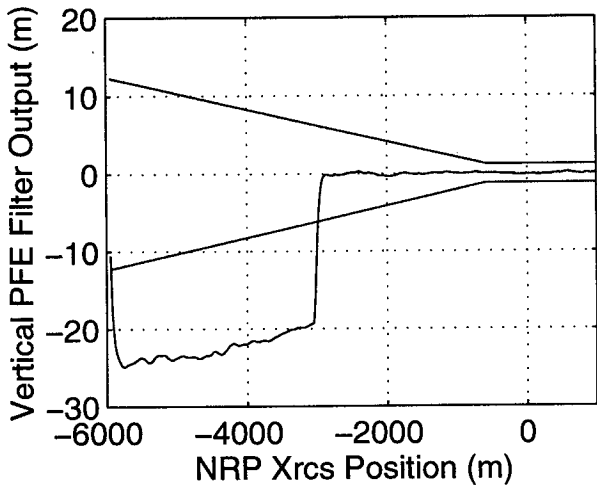
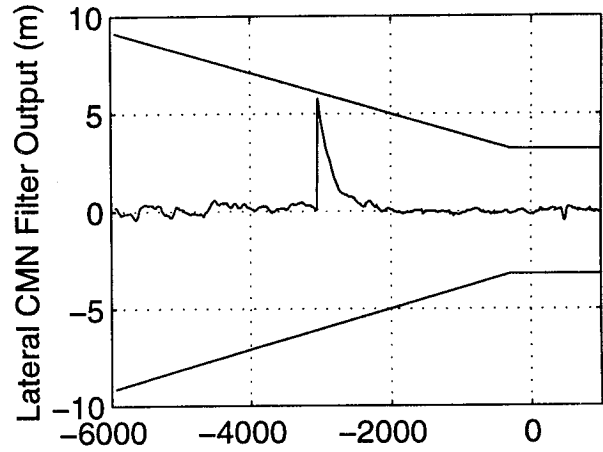
LGRP Xrcs POSITION (m): 74.498
LGRP Yrcs POSITION (m): 1.592



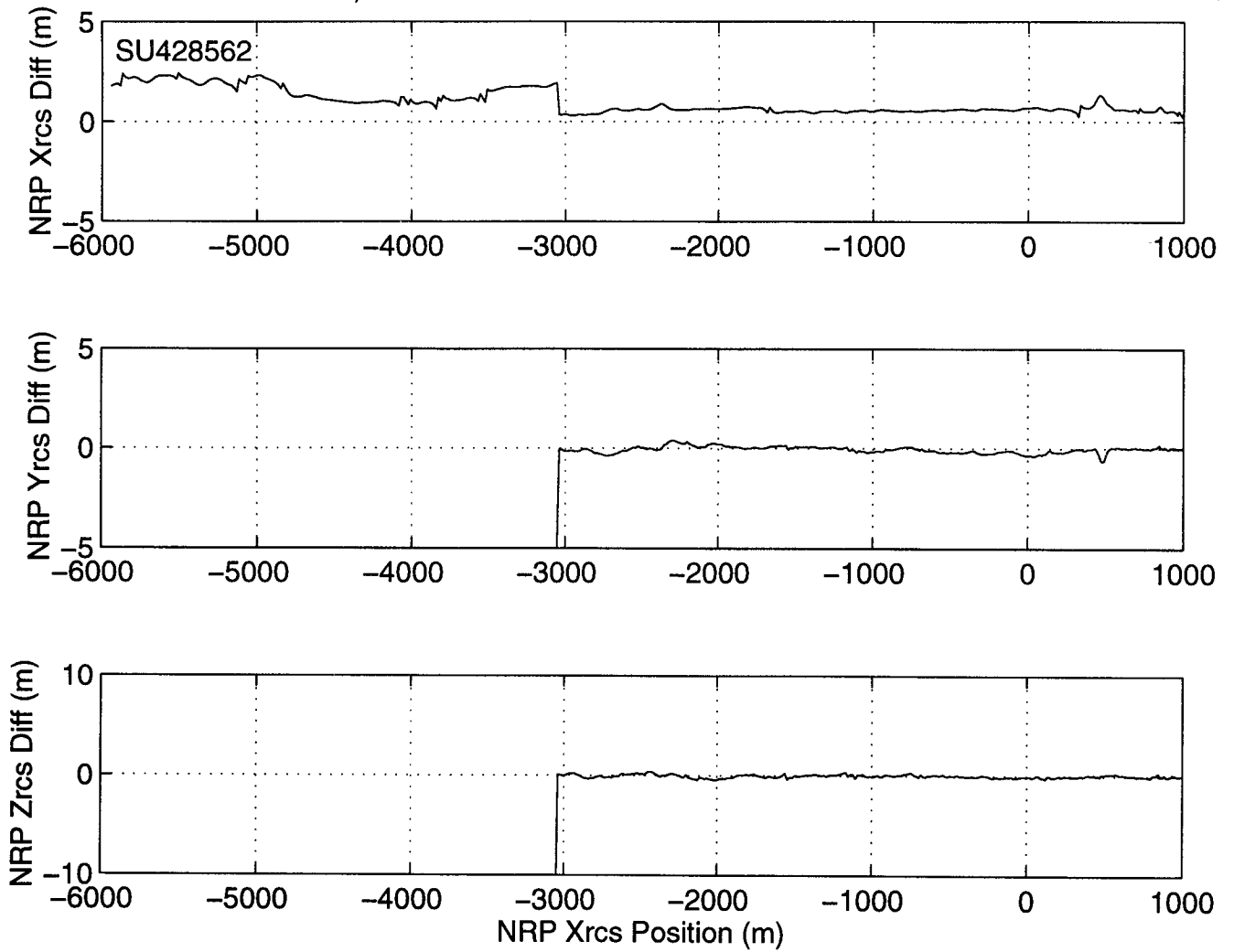
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428564
START TIME: 335799.249
STOP TIME: 335912.999

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.9
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.681
NRP Yrcs MEAN DIFFERENCE (m): -0.114
NRP Zrcs MEAN DIFFERENCE (m): 0.103

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.228
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.255
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.263

NRP Xrcs 2-RMS DIFFERENCE (m): 1.382
NRP Yrcs 2-RMS DIFFERENCE (m): 0.342
NRP Zrcs 2-RMS DIFFERENCE (m): 0.335

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 98.249
LGRP Yrcs POSITION (m): -0.341

APPROACH #: SU428564
START TIME: 335799.249
STOP TIME: 335912.999

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.6
MAXIMUM VDOP: 5.9
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

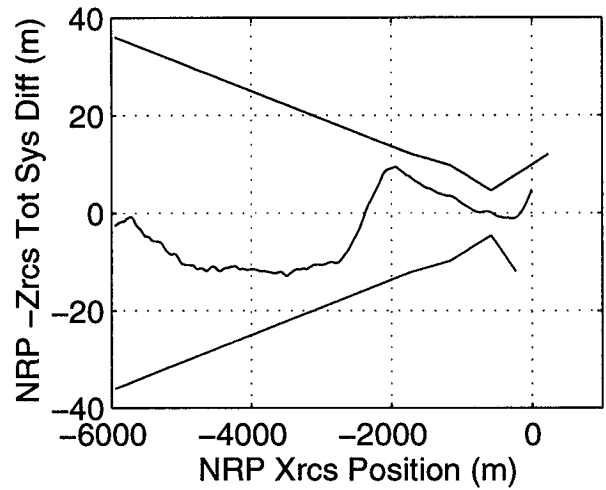
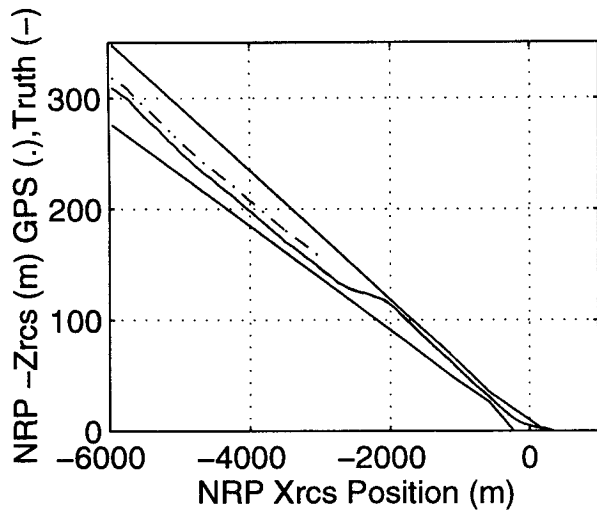
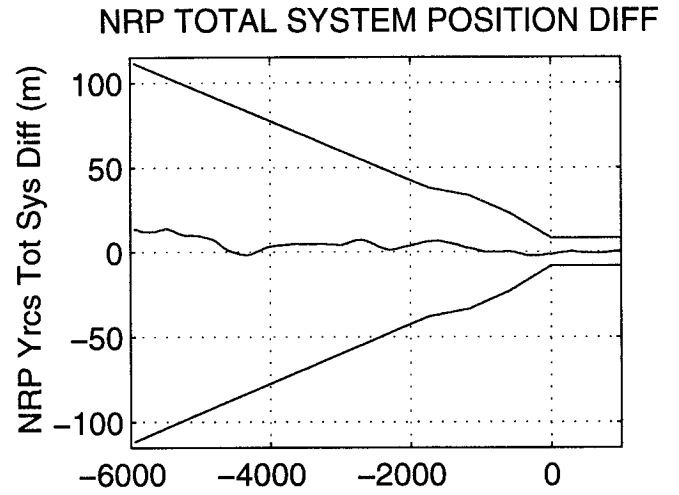
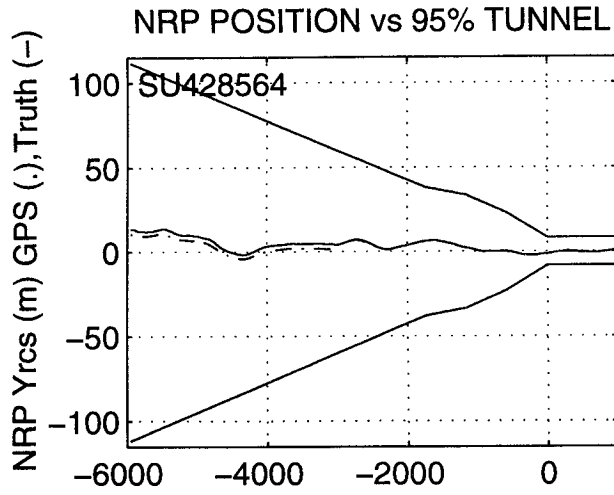
NRP Xrcs MEAN DIFFERENCE (m): 0.681
NRP Yrcs MEAN DIFFERENCE (m): -0.114
NRP Zrcs MEAN DIFFERENCE (m): 0.103

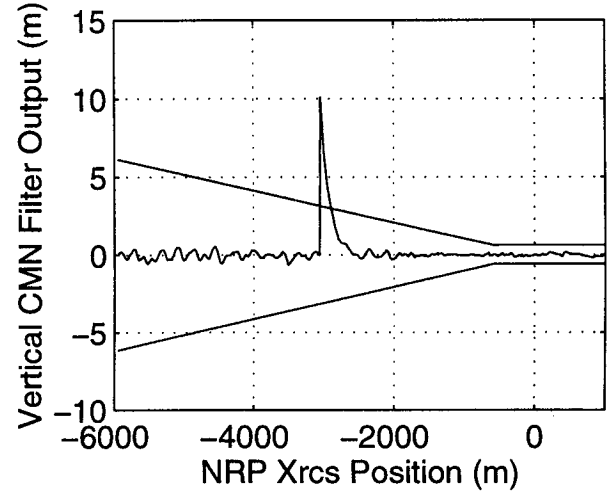
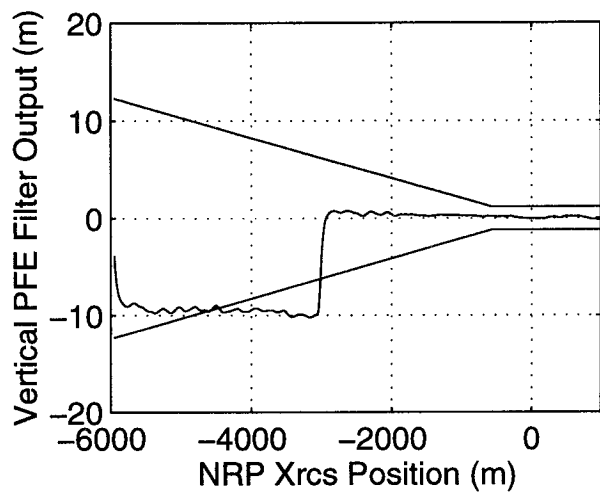
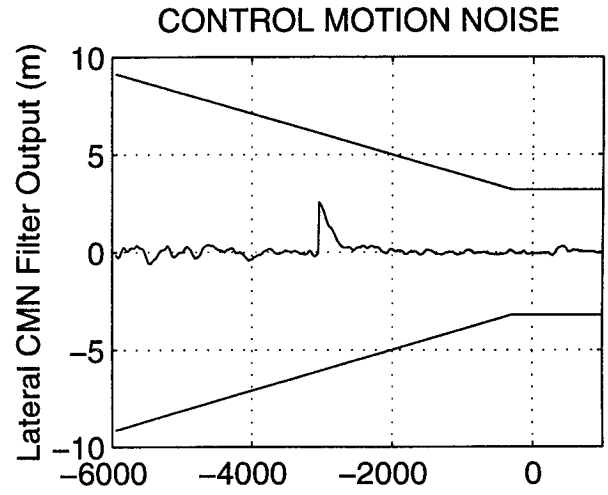
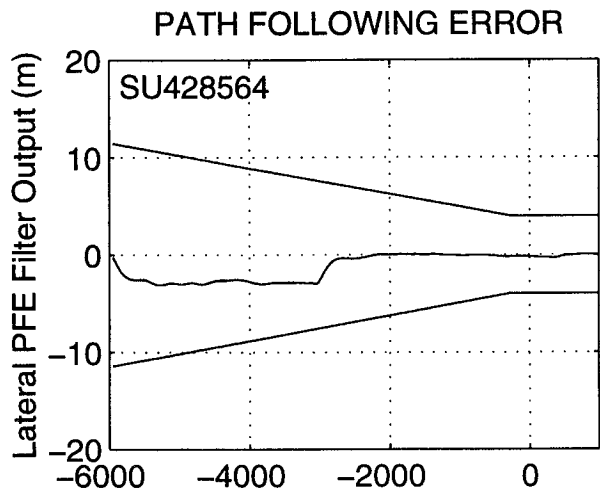
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.228
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.255
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.263

NRP Xrcs 2-RMS DIFFERENCE (m): 1.382
NRP Yrcs 2-RMS DIFFERENCE (m): 0.342
NRP Zrcs 2-RMS DIFFERENCE (m): 0.335

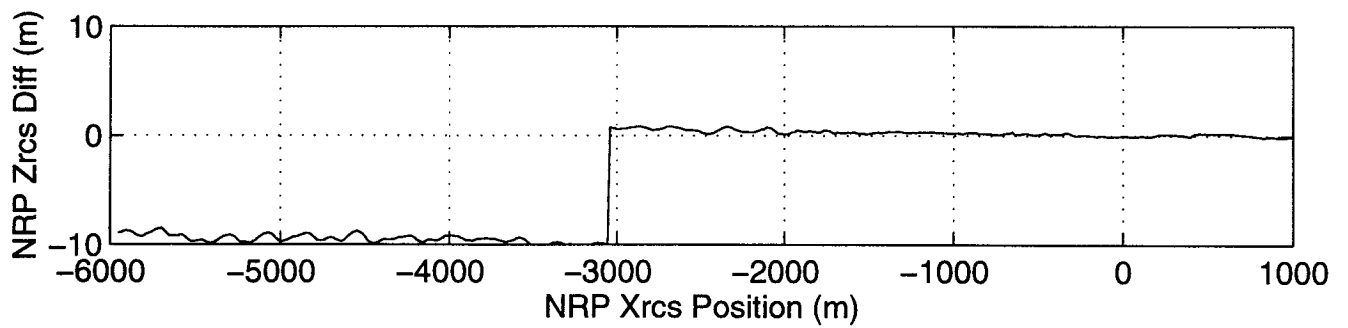
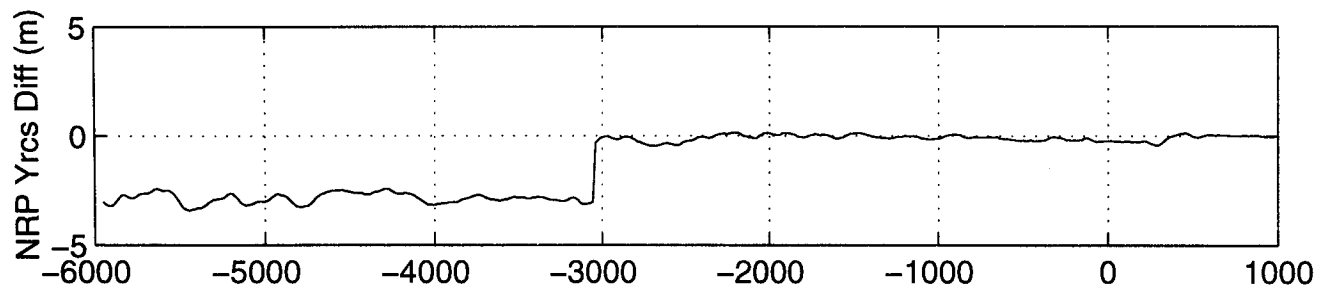
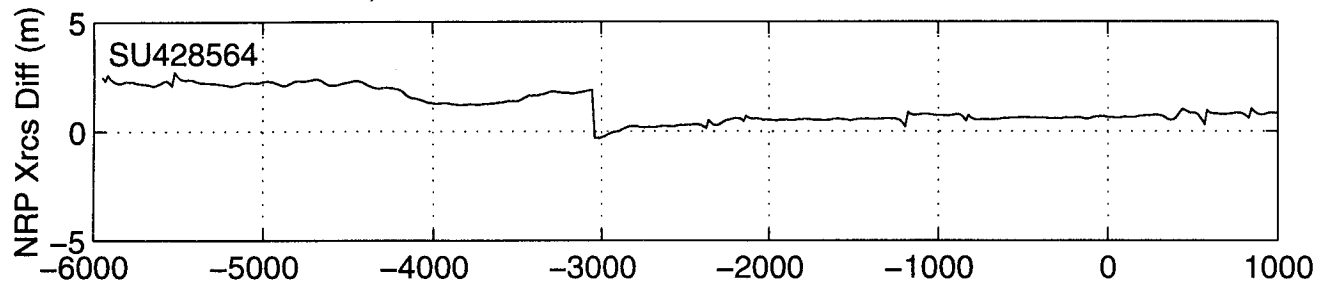
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 98.249
LGRP Yrcs POSITION (m): -0.341





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428610
START TIME: 408867.249
STOP TIME: 408971.249

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.9
MAXIMUM VDOP: 4.0
AVERAGE VDOP: 3.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.257
NRP Yrcs MEAN DIFFERENCE (m): -0.091
NRP Zrcs MEAN DIFFERENCE (m): 0.041

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.103
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.123
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.234

NRP Xrcs 2-RMS DIFFERENCE (m): 0.525
NRP Yrcs 2-RMS DIFFERENCE (m): 0.220
NRP Zrcs 2-RMS DIFFERENCE (m): 0.248

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 204.498
LGRP Yrcs POSITION (m): -0.537

APPROACH #: SU428610
START TIME: 408867.249
STOP TIME: 408971.249

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.9
MAXIMUM VDOP: 4.0
AVERAGE VDOP: 3.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

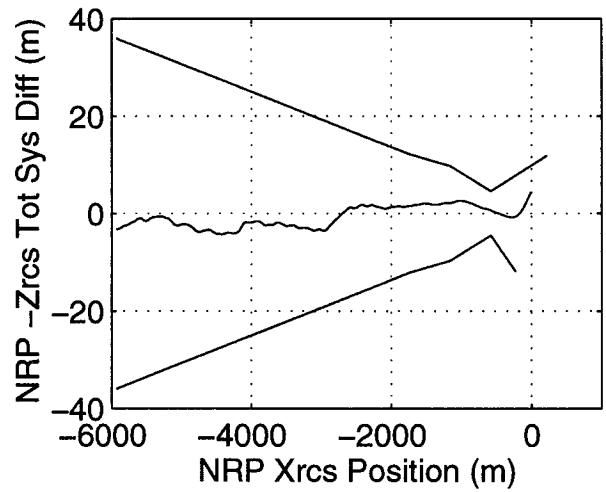
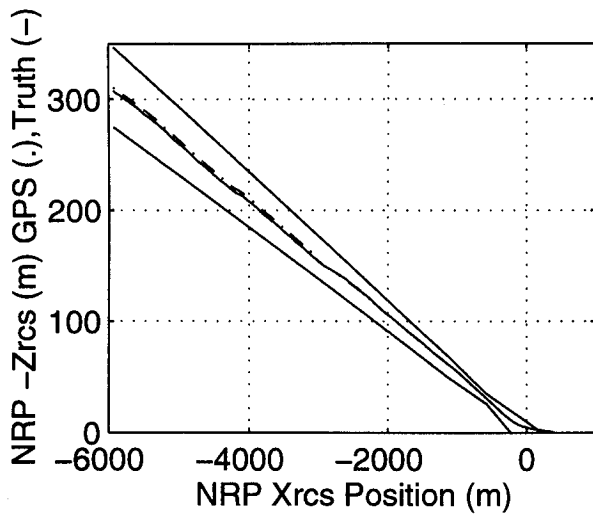
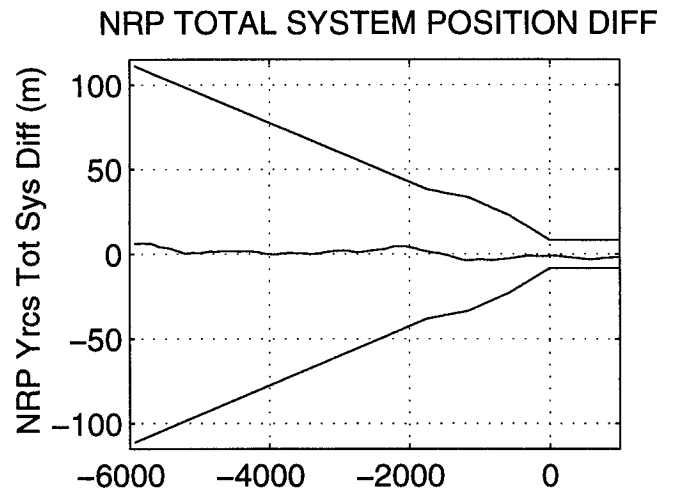
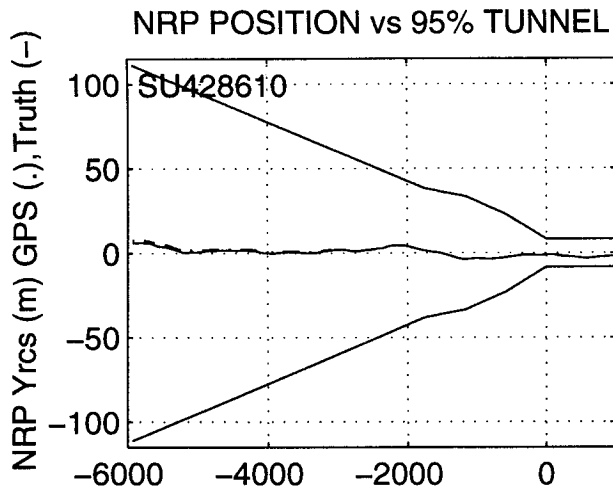
NRP Xrcs MEAN DIFFERENCE (m): 0.257
NRP Yrcs MEAN DIFFERENCE (m): -0.091
NRP Zrcs MEAN DIFFERENCE (m): 0.041

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.103
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.123
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.234

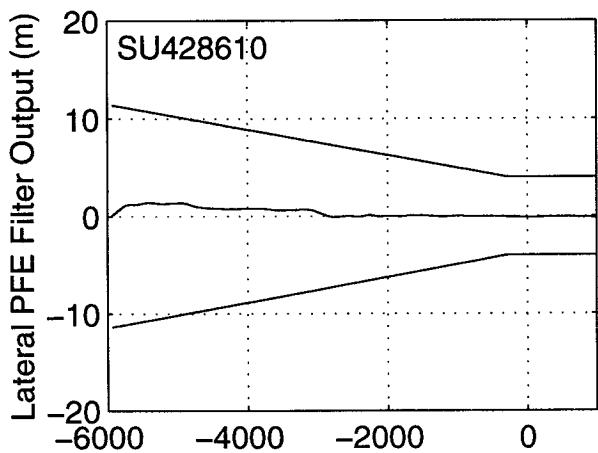
NRP Xrcs 2-RMS DIFFERENCE (m): 0.525
NRP Yrcs 2-RMS DIFFERENCE (m): 0.220
NRP Zrcs 2-RMS DIFFERENCE (m): 0.248

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

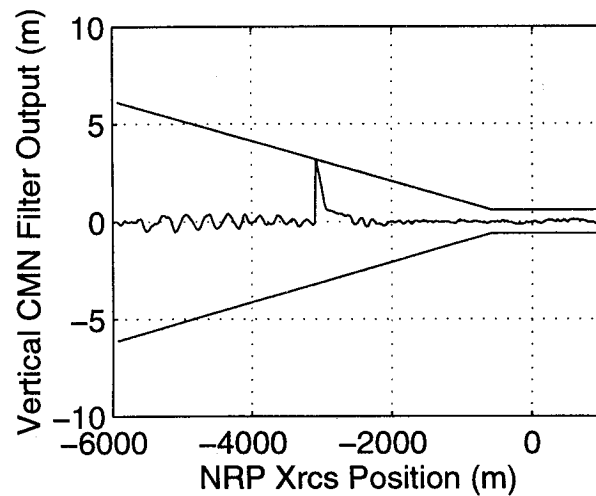
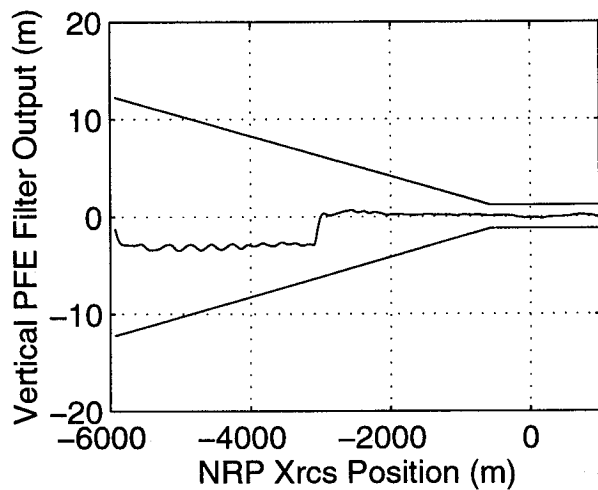
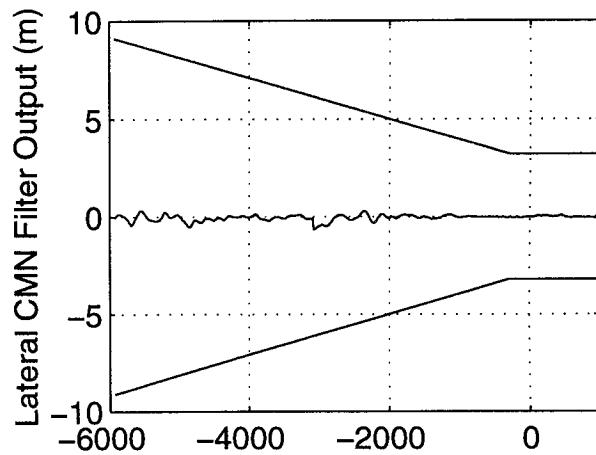
LGRP Xrcs POSITION (m): 204.498
LGRP Yrcs POSITION (m): -0.537



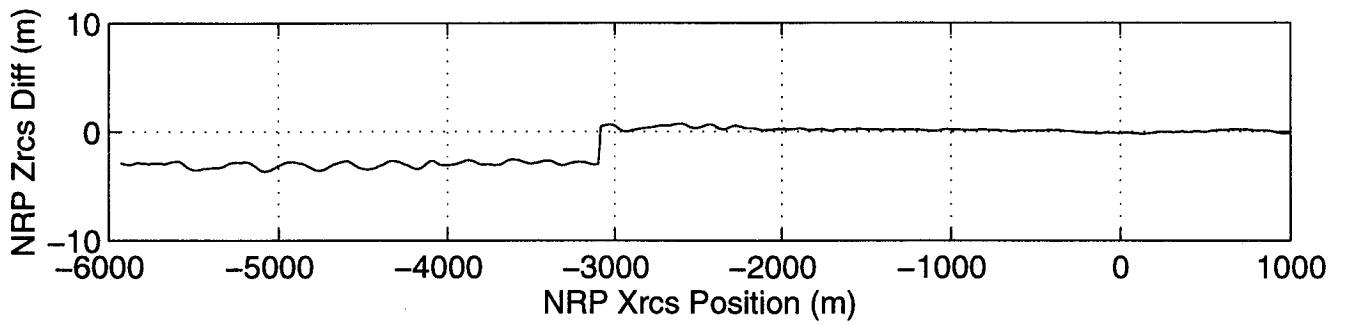
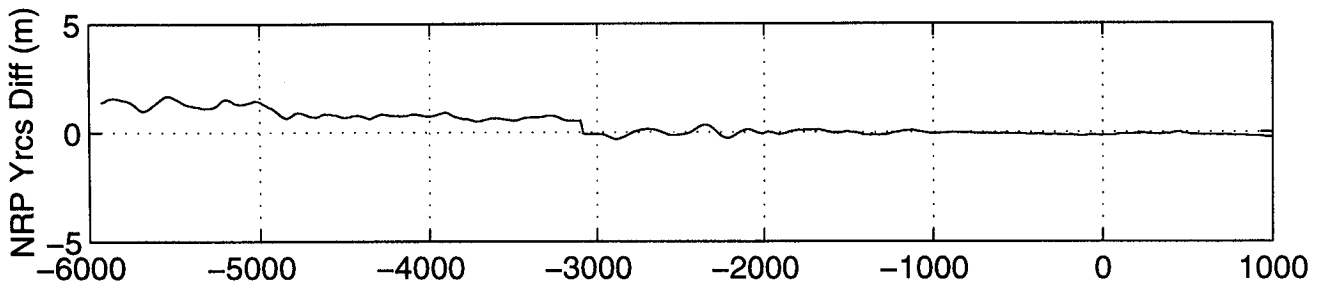
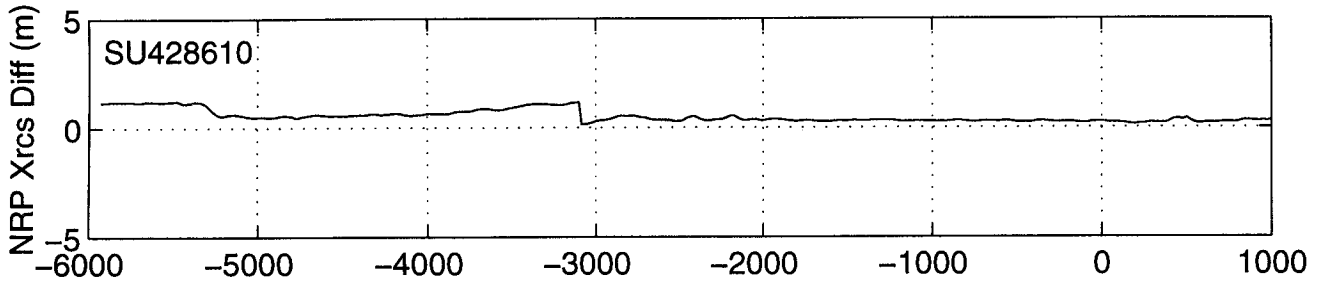
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428614
START TIME: 409663.749
STOP TIME: 409764.749

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.5
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.367
NRP Yrcs MEAN DIFFERENCE (m): -0.108
NRP Zrcs MEAN DIFFERENCE (m): 0.068

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.117
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.217
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.210

NRP Xrcs 2-RMS DIFFERENCE (m): 0.743
NRP Yrcs 2-RMS DIFFERENCE (m): 0.306
NRP Zrcs 2-RMS DIFFERENCE (m): 0.251

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 169.845
LGRP Yrcs POSITION (m): 2.610

APPROACH #: SU428614
START TIME: 409663.749
STOP TIME: 409764.749

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.5
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

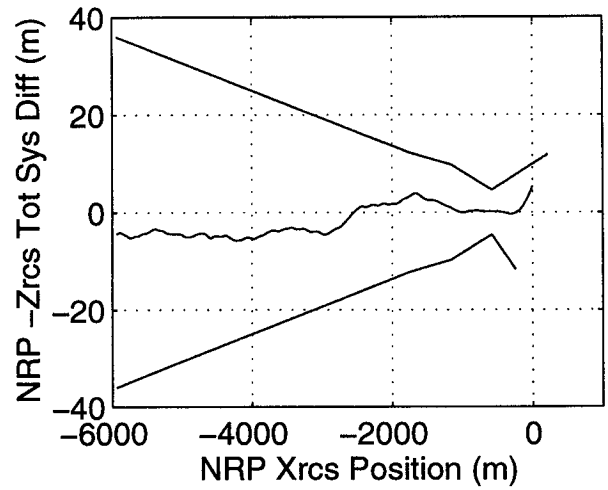
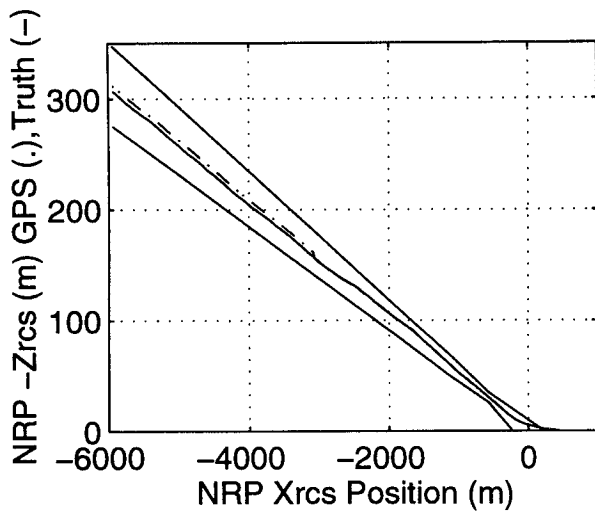
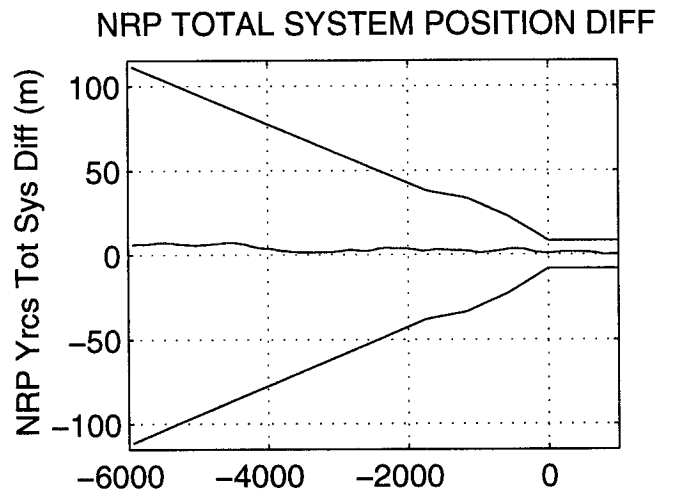
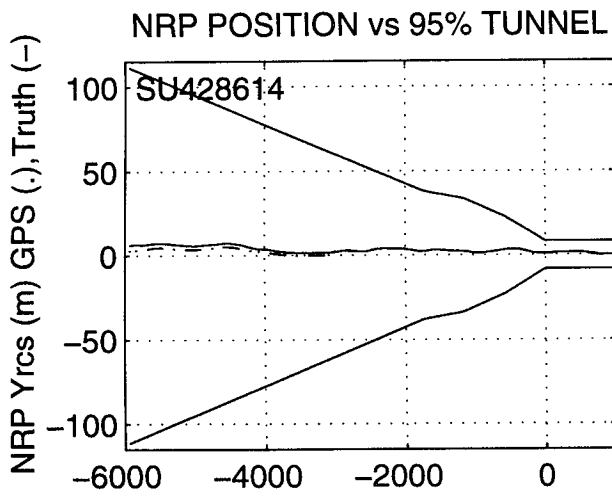
NRP Xrcs MEAN DIFFERENCE (m): 0.367
NRP Yrcs MEAN DIFFERENCE (m): -0.108
NRP Zrcs MEAN DIFFERENCE (m): 0.068

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.117
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.217
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.210

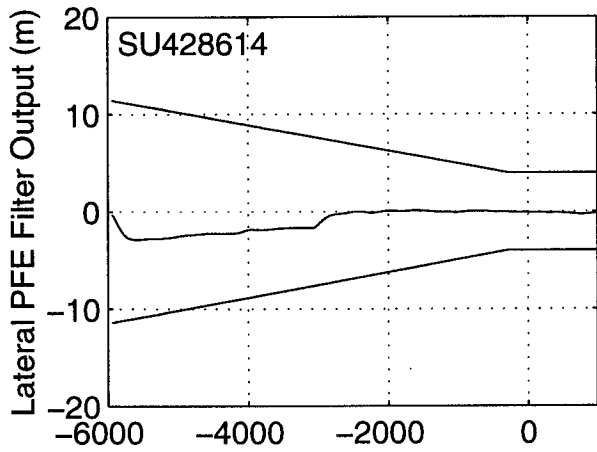
NRP Xrcs 2-RMS DIFFERENCE (m): 0.743
NRP Yrcs 2-RMS DIFFERENCE (m): 0.306
NRP Zrcs 2-RMS DIFFERENCE (m): 0.251

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

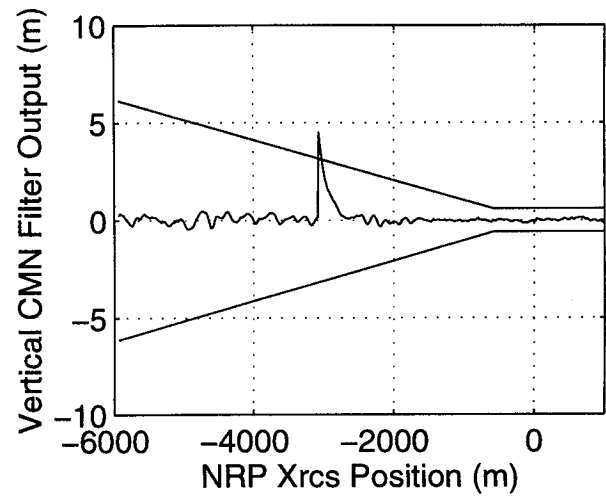
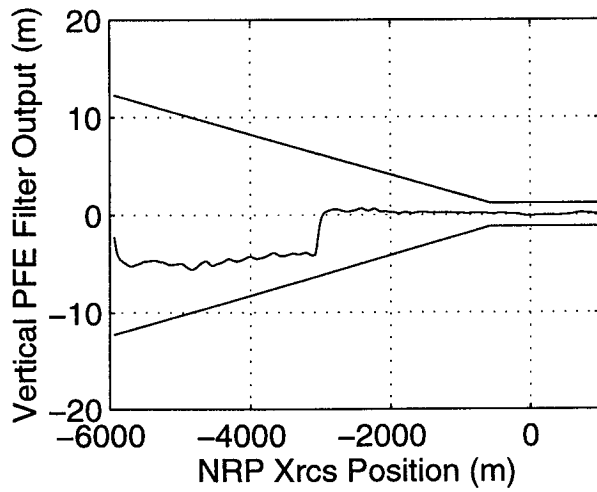
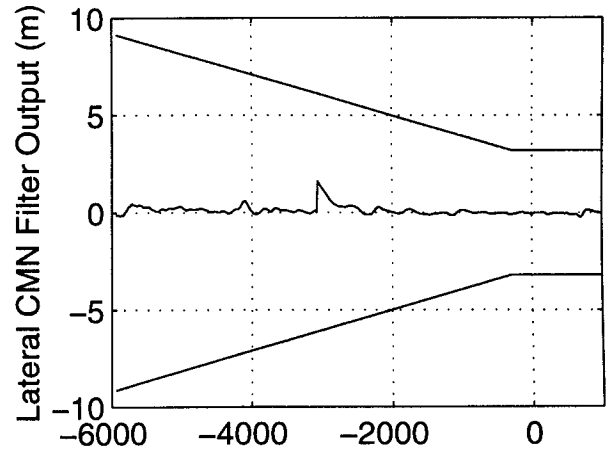
LGRP Xrcs POSITION (m): 169.845
LGRP Yrcs POSITION (m): 2.610



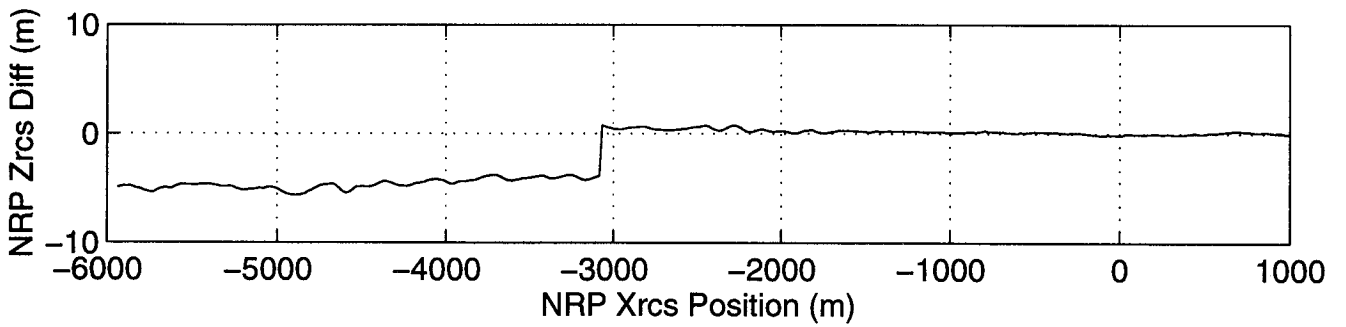
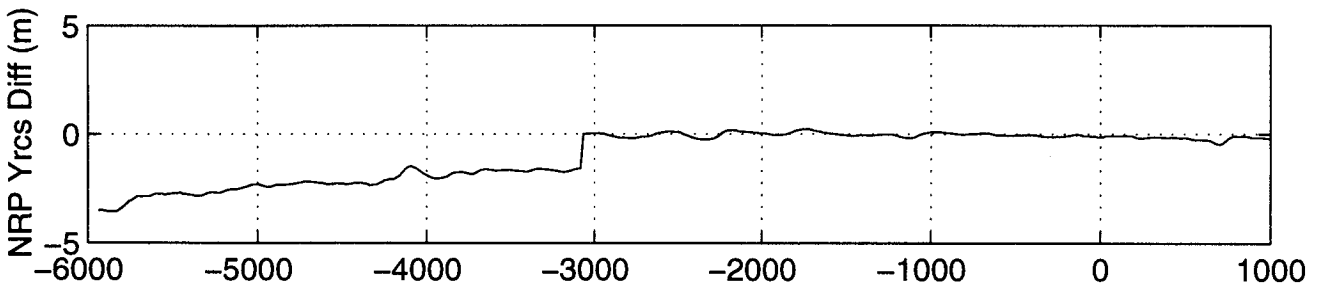
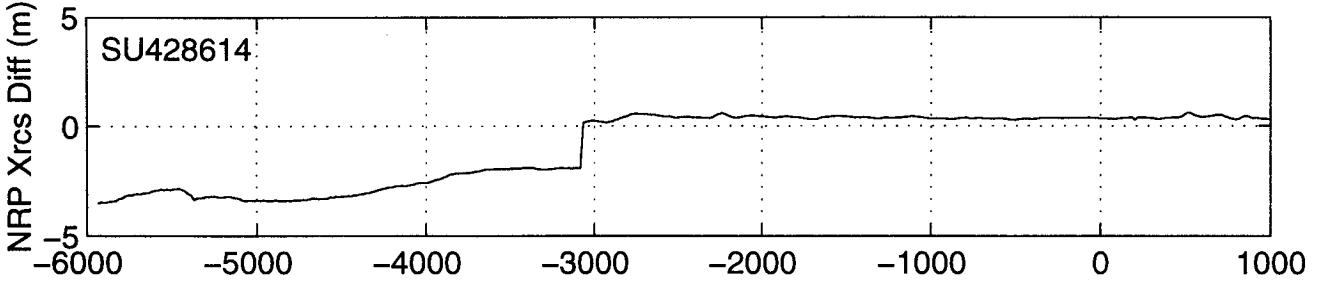
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428616
START TIME: 410056.999
STOP TIME: 410163.499

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 4.3
MAXIMUM VDOP: 4.4
AVERAGE VDOP: 4.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.309
NRP Yrcs MEAN DIFFERENCE (m): -0.154
NRP Zrcs MEAN DIFFERENCE (m): 0.025

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.152
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.120
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.199

NRP Xrcs 2-RMS DIFFERENCE (m): 0.637
NRP Yrcs 2-RMS DIFFERENCE (m): 0.331
NRP Zrcs 2-RMS DIFFERENCE (m): 0.206

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 257.102
LGRP Yrcs POSITION (m): 0.894

APPROACH #: SU428616
START TIME: 410056.999
STOP TIME: 410163.499

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 4.3
MAXIMUM VDOP: 4.4
AVERAGE VDOP: 4.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

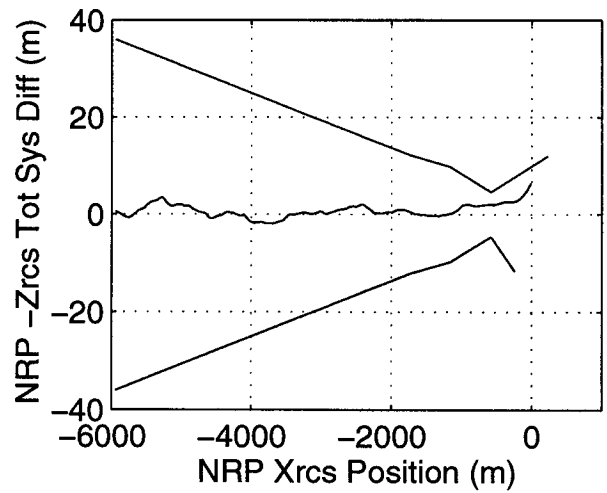
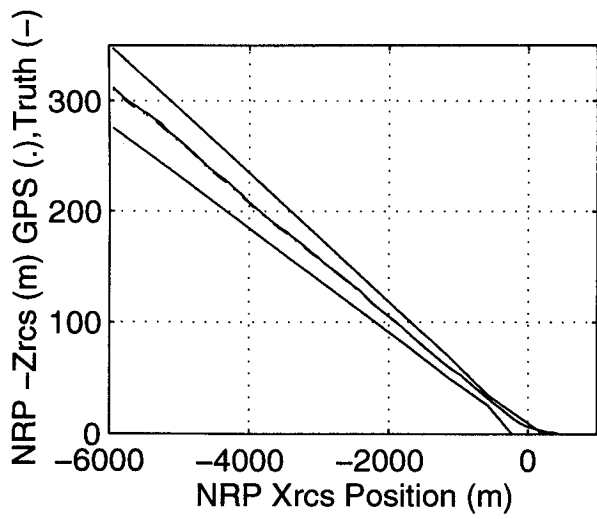
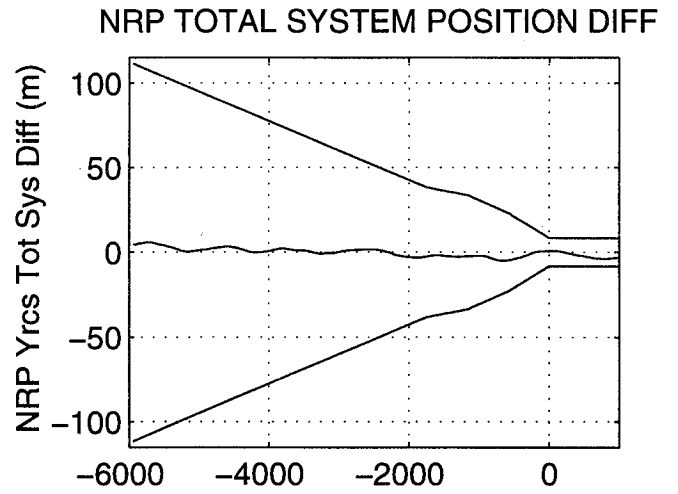
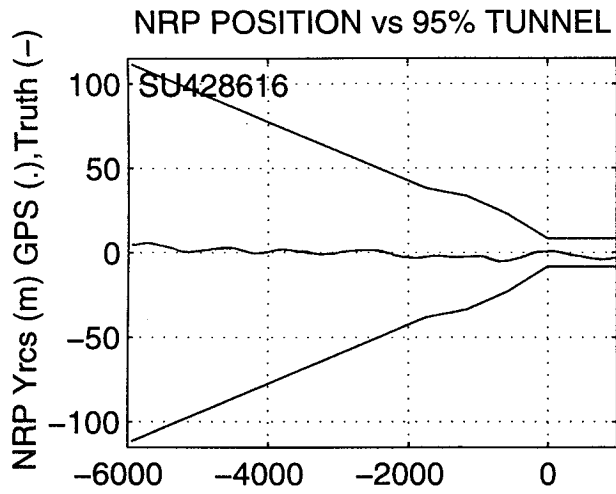
NRP Xrcs MEAN DIFFERENCE (m): 0.309
NRP Yrcs MEAN DIFFERENCE (m): -0.154
NRP Zrcs MEAN DIFFERENCE (m): 0.025

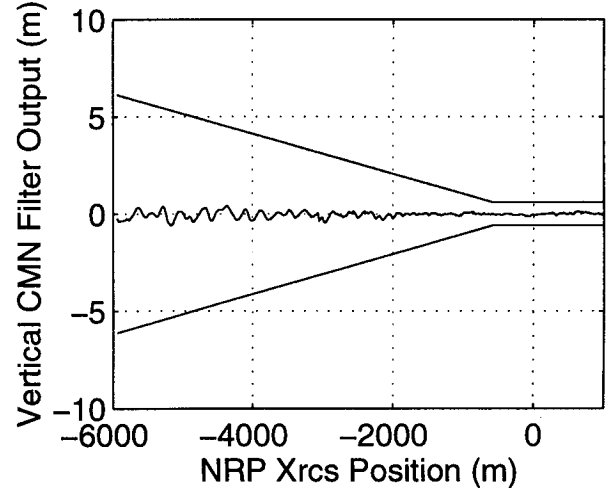
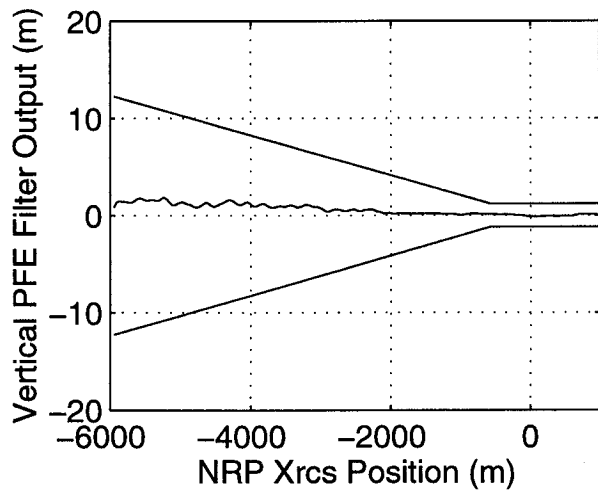
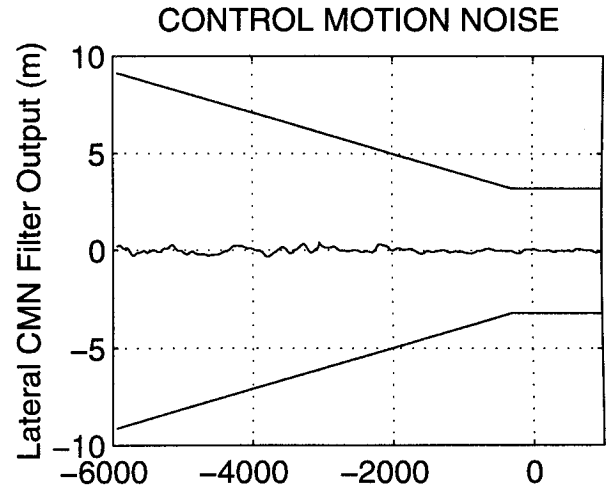
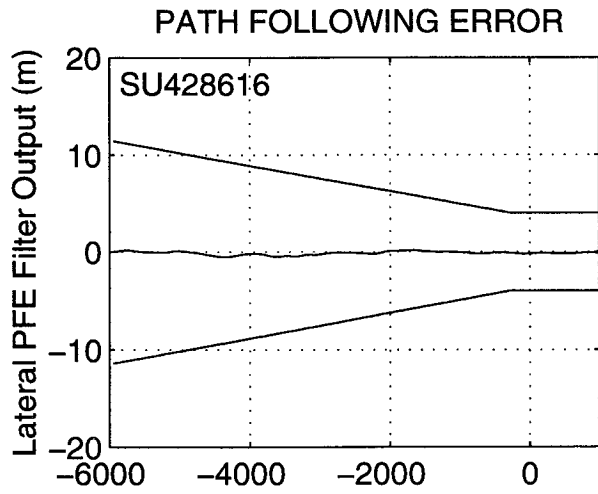
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.152
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.120
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.199

NRP Xrcs 2-RMS DIFFERENCE (m): 0.637
NRP Yrcs 2-RMS DIFFERENCE (m): 0.331
NRP Zrcs 2-RMS DIFFERENCE (m): 0.206

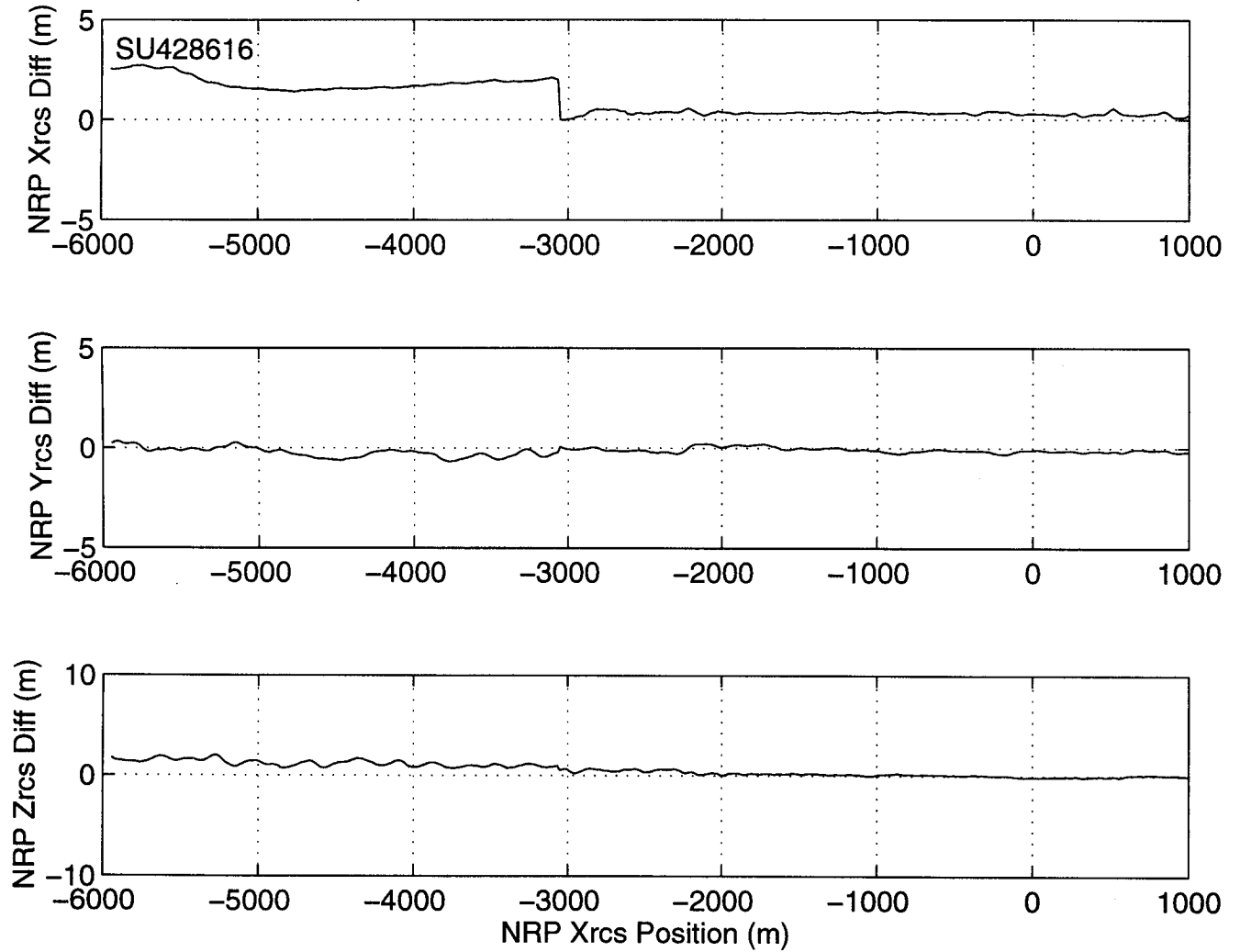
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 257.102
LGRP Yrcs POSITION (m): 0.894





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428618
START TIME: 410458.499
STOP TIME: 410566.749

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.5
MAXIMUM VDOP: 4.6
AVERAGE VDOP: 4.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.263
NRP Yrcs MEAN DIFFERENCE (m): -0.033
NRP Zrcs MEAN DIFFERENCE (m): 0.054

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.126
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.110
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.225

NRP Xrcs 2-RMS DIFFERENCE (m): 0.540
NRP Yrcs 2-RMS DIFFERENCE (m): 0.128
NRP Zrcs 2-RMS DIFFERENCE (m): 0.250

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.020
LGRP Yrcs POSITION (m): 3.021

APPROACH #: SU428618
START TIME: 410458.499
STOP TIME: 410566.749

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.5
MAXIMUM VDOP: 4.6
AVERAGE VDOP: 4.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

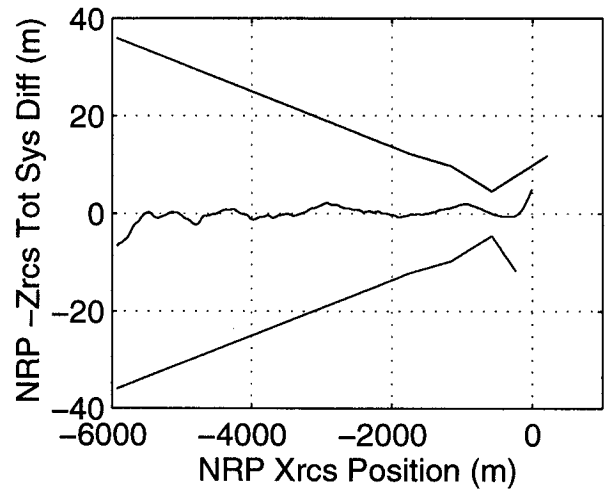
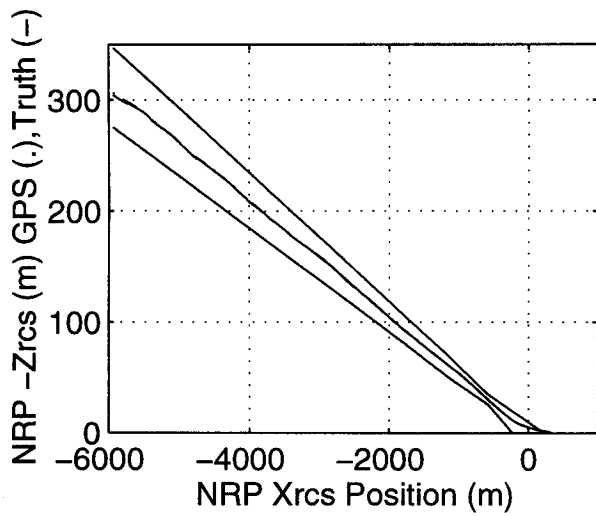
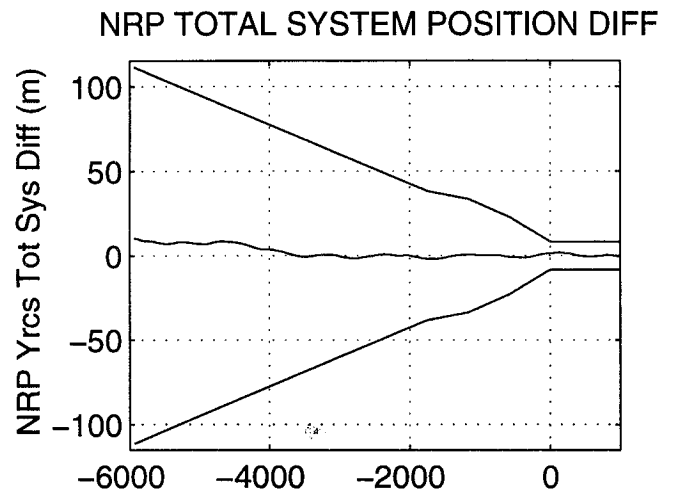
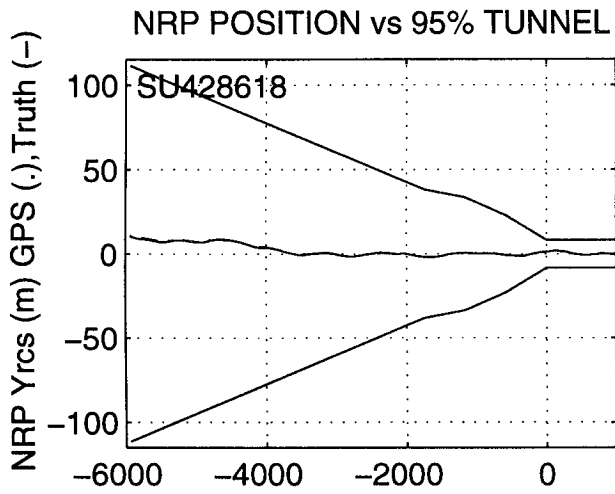
NRP Xrcs MEAN DIFFERENCE (m): 0.263
NRP Yrcs MEAN DIFFERENCE (m): -0.033
NRP Zrcs MEAN DIFFERENCE (m): 0.054

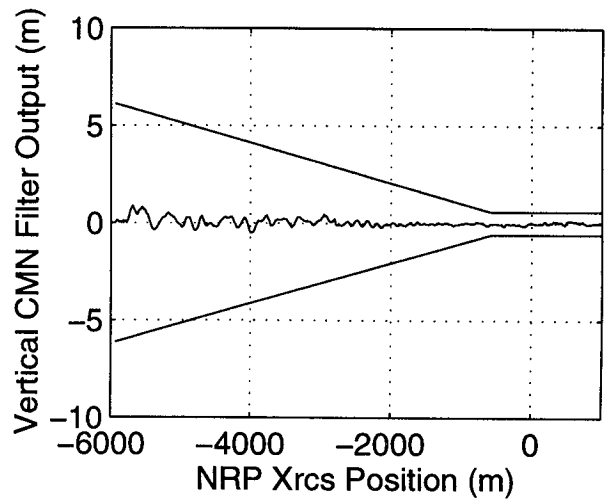
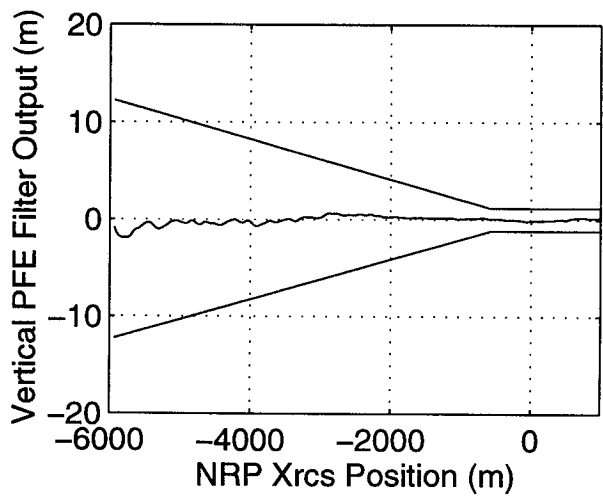
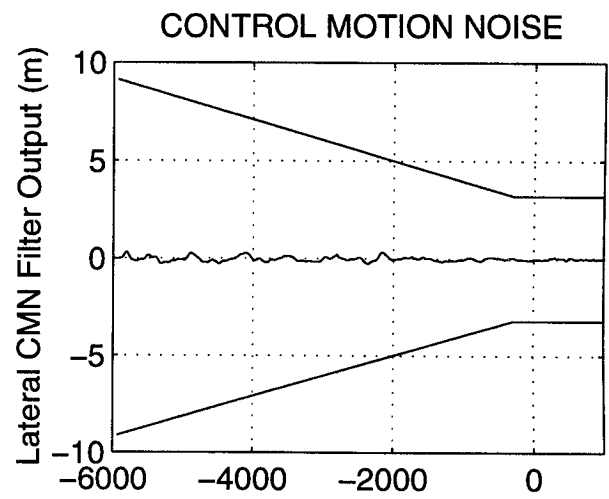
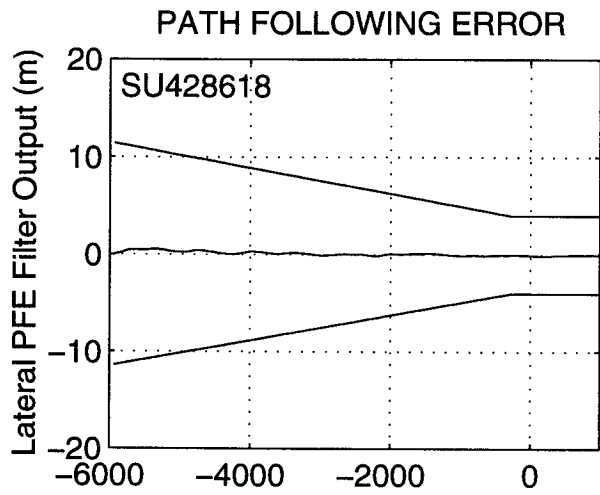
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.126
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.110
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.225

NRP Xrcs 2-RMS DIFFERENCE (m): 0.540
NRP Yrcs 2-RMS DIFFERENCE (m): 0.128
NRP Zrcs 2-RMS DIFFERENCE (m): 0.250

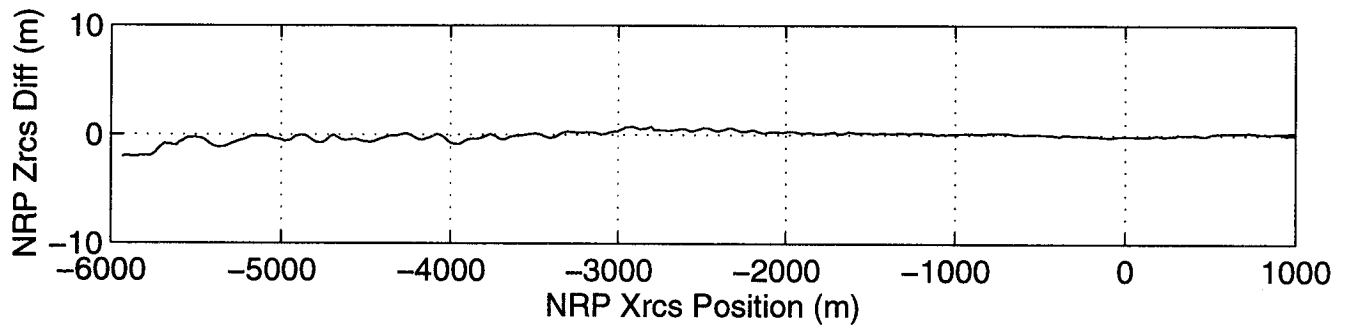
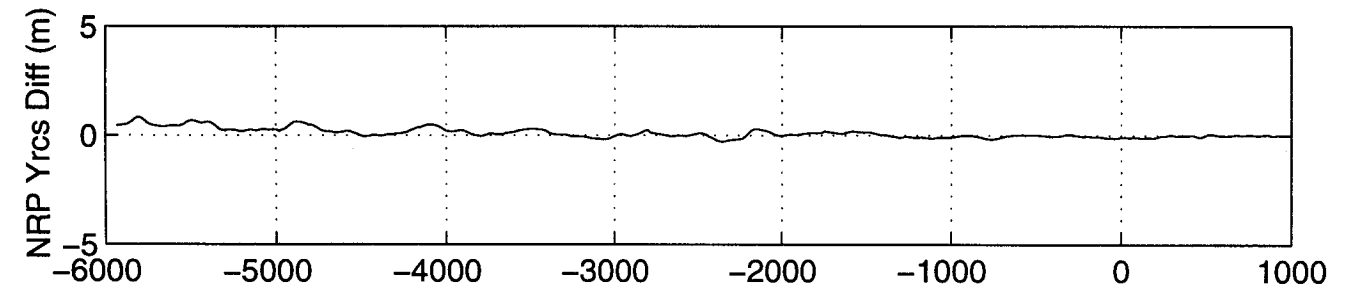
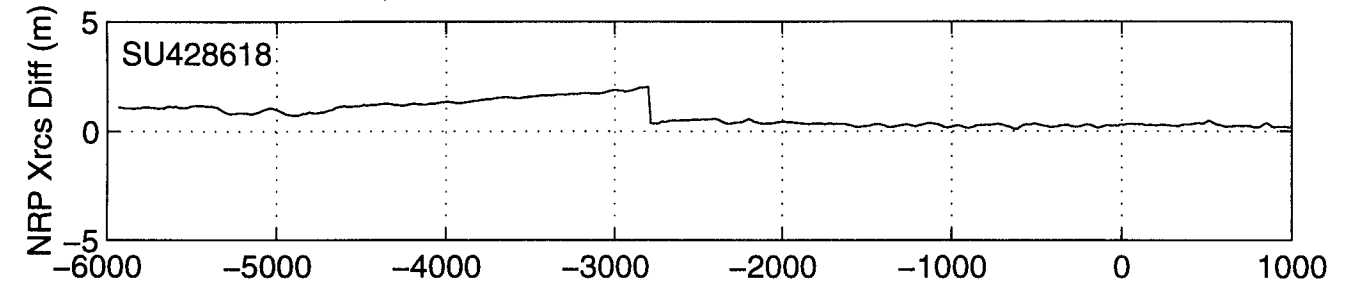
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.020
LGRP Yrcs POSITION (m): 3.021





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428620
START TIME: 411299.999
STOP TIME: 411404.749

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.173
NRP Yrcs MEAN DIFFERENCE (m): -0.094
NRP Zrcs MEAN DIFFERENCE (m): 0.000

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.200
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.158
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.240

NRP Xrcs 2-RMS DIFFERENCE (m): 0.399
NRP Yrcs 2-RMS DIFFERENCE (m): 0.246
NRP Zrcs 2-RMS DIFFERENCE (m): 0.240

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 244.557
LGRP Yrcs POSITION (m): 1.156

APPROACH #: SU428620
START TIME: 411299.999
STOP TIME: 411404.749

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

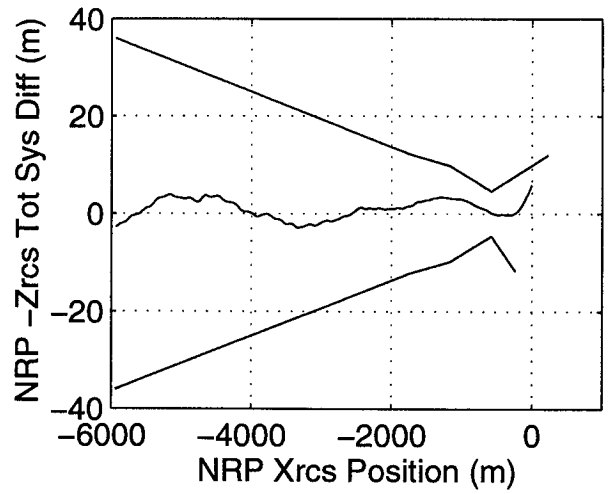
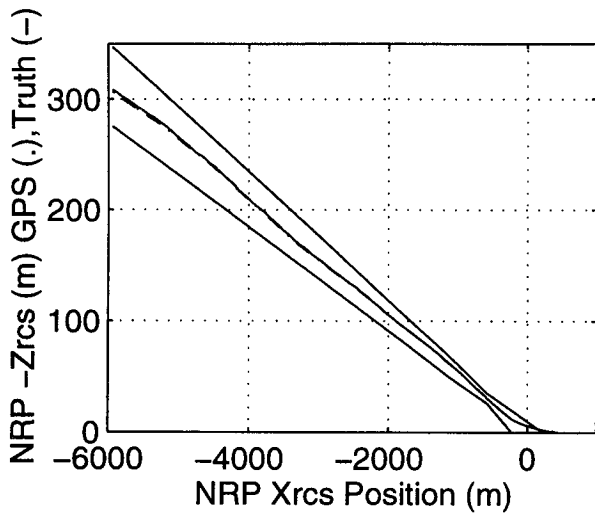
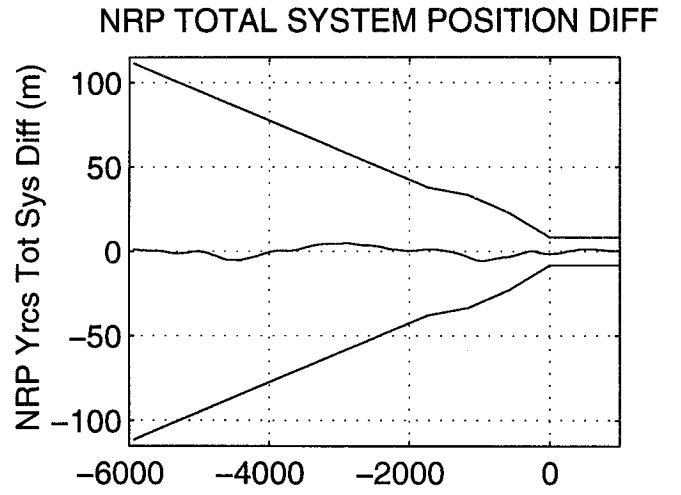
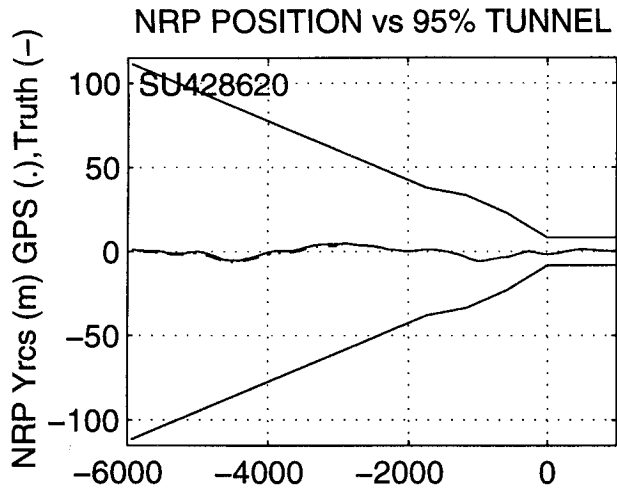
NRP Xrcs MEAN DIFFERENCE (m): 0.173
NRP Yrcs MEAN DIFFERENCE (m): -0.094
NRP Zrcs MEAN DIFFERENCE (m): 0.000

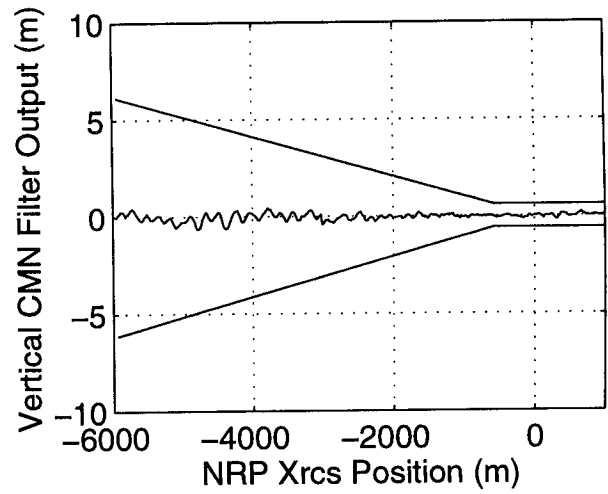
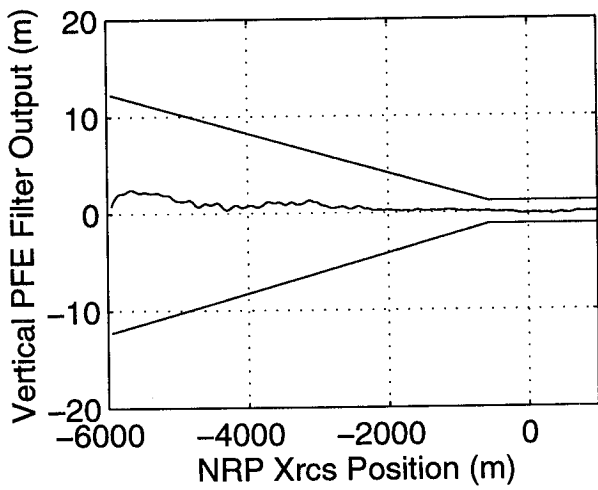
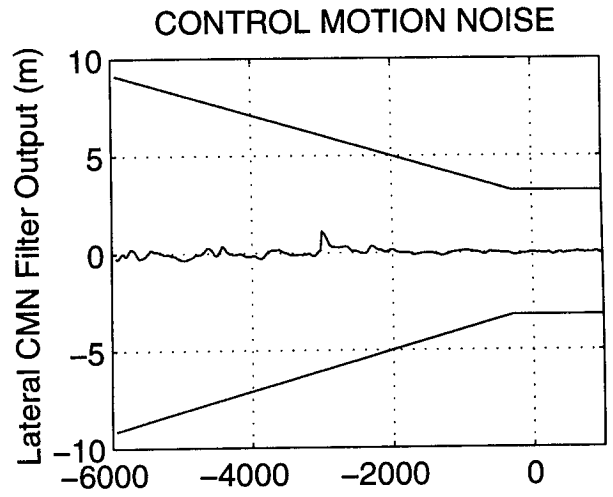
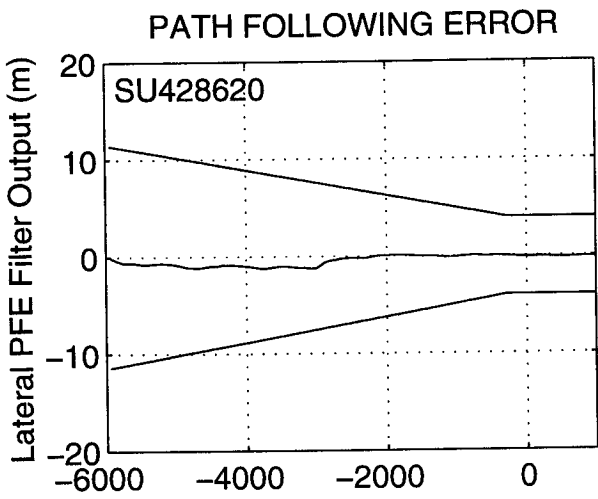
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.200
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.158
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.240

NRP Xrcs 2-RMS DIFFERENCE (m): 0.399
NRP Yrcs 2-RMS DIFFERENCE (m): 0.246
NRP Zrcs 2-RMS DIFFERENCE (m): 0.240

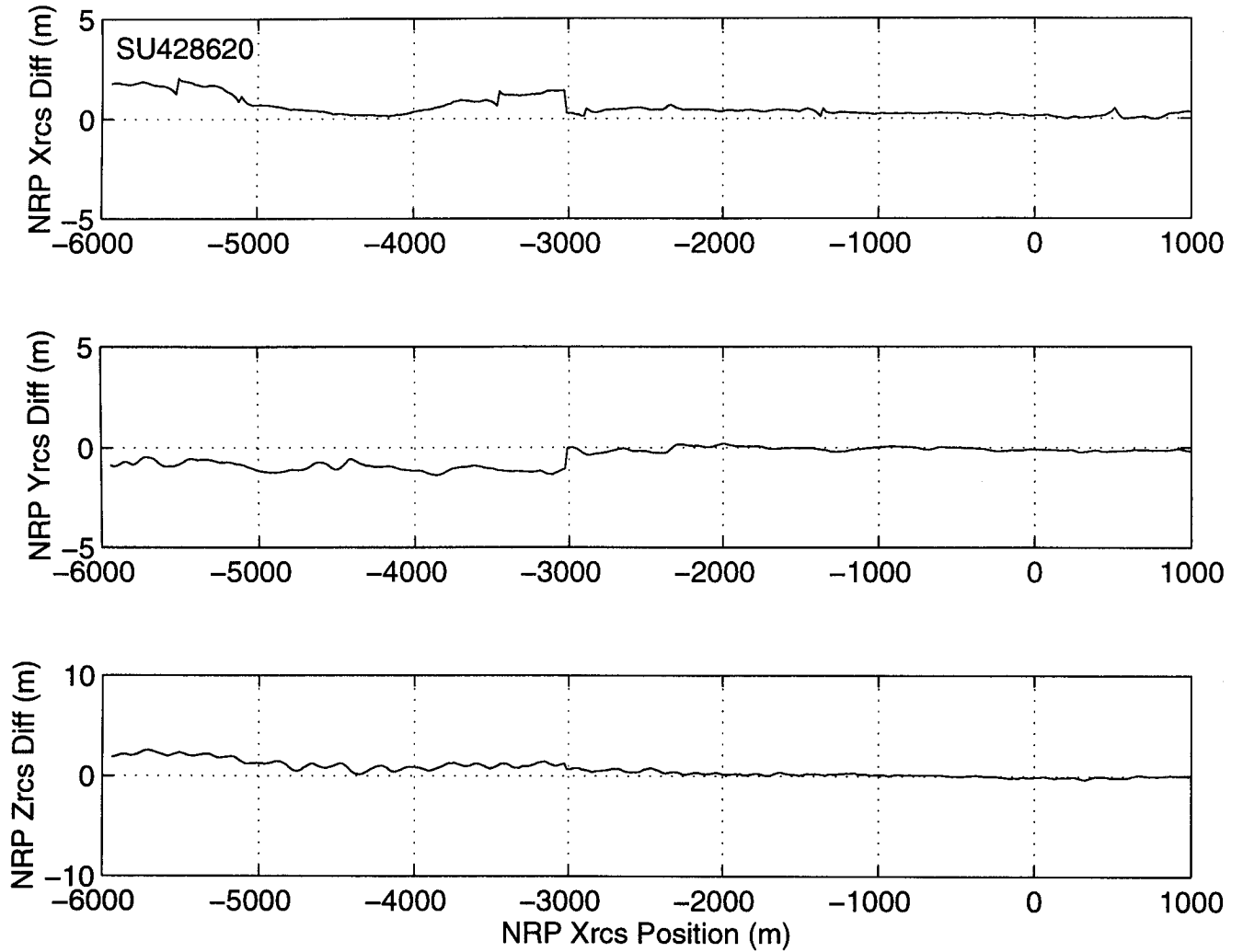
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 244.557
LGRP Yrcs POSITION (m): 1.156





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428622
START TIME: 411712.499
STOP TIME: 411818.999

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.9
MAXIMUM VDOP: 6.1
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.280
NRP Yrcs MEAN DIFFERENCE (m): -0.159
NRP Zrcs MEAN DIFFERENCE (m): 0.053

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.144
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.172
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.197

NRP Xrcs 2-RMS DIFFERENCE (m): 0.579
NRP Yrcs 2-RMS DIFFERENCE (m): 0.361
NRP Zrcs 2-RMS DIFFERENCE (m): 0.224

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 282.318
LGRP Yrcs POSITION (m): 1.215

APPROACH #: SU428622
START TIME: 411712.499
STOP TIME: 411818.999

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.0

MINIMUM VDOP: 5.9
MAXIMUM VDOP: 6.1
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

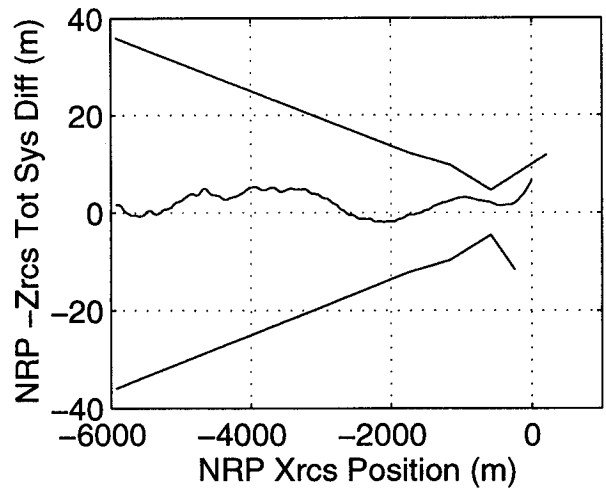
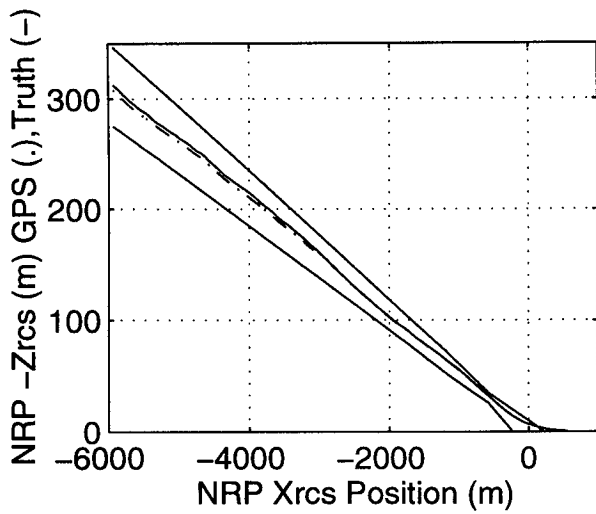
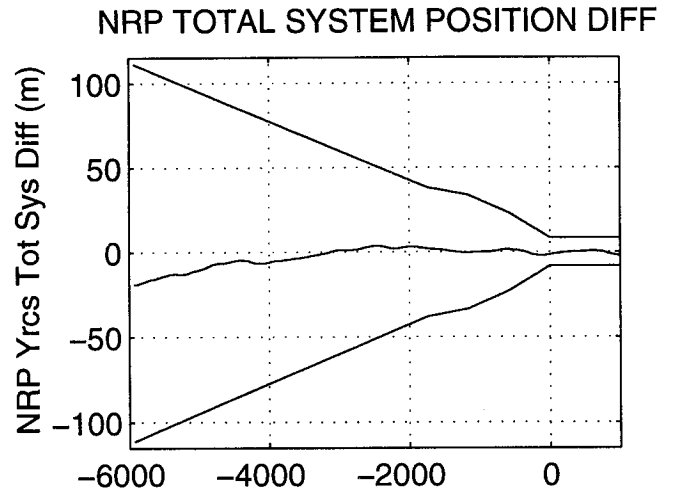
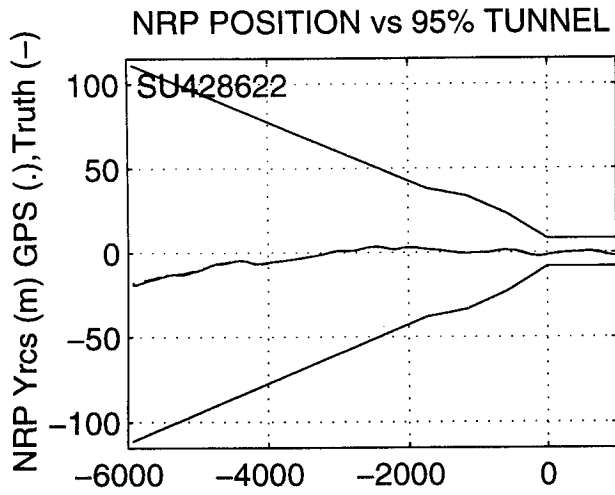
NRP Xrcs MEAN DIFFERENCE (m): 0.280
NRP Yrcs MEAN DIFFERENCE (m): -0.159
NRP Zrcs MEAN DIFFERENCE (m): 0.053

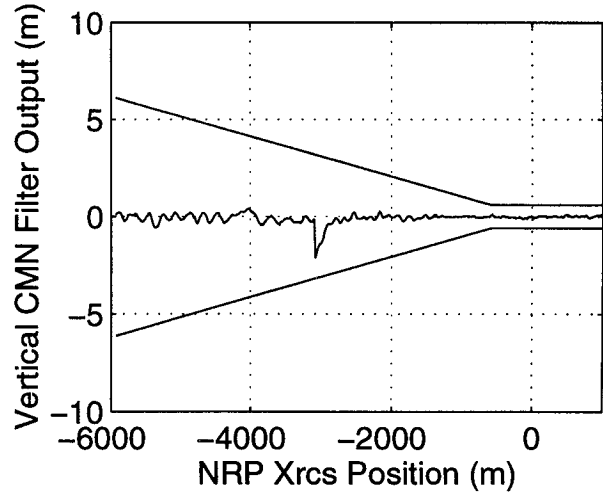
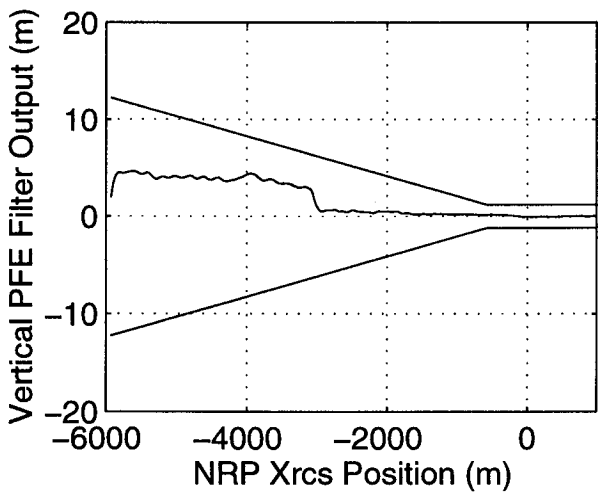
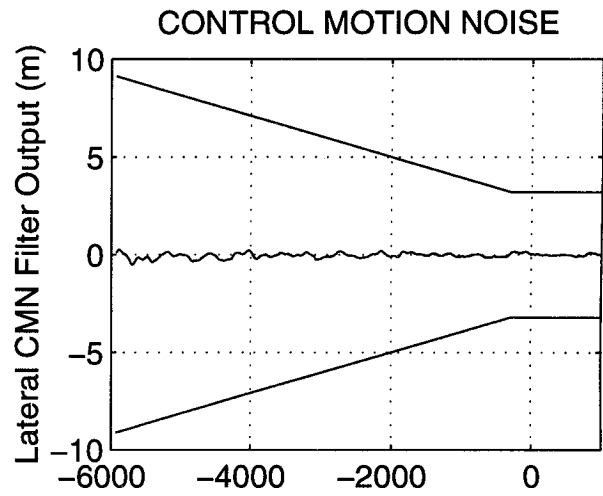
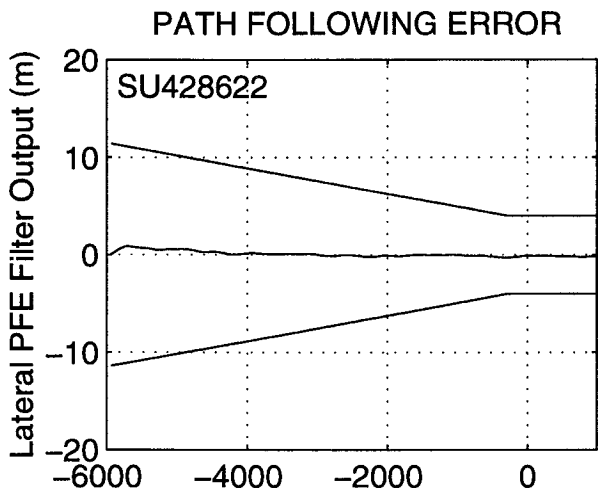
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.144
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.172
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.197

NRP Xrcs 2-RMS DIFFERENCE (m): 0.579
NRP Yrcs 2-RMS DIFFERENCE (m): 0.361
NRP Zrcs 2-RMS DIFFERENCE (m): 0.224

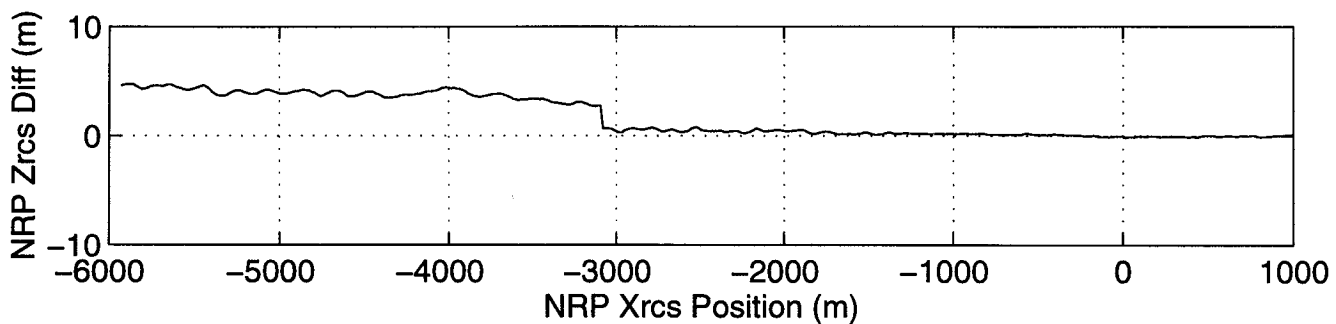
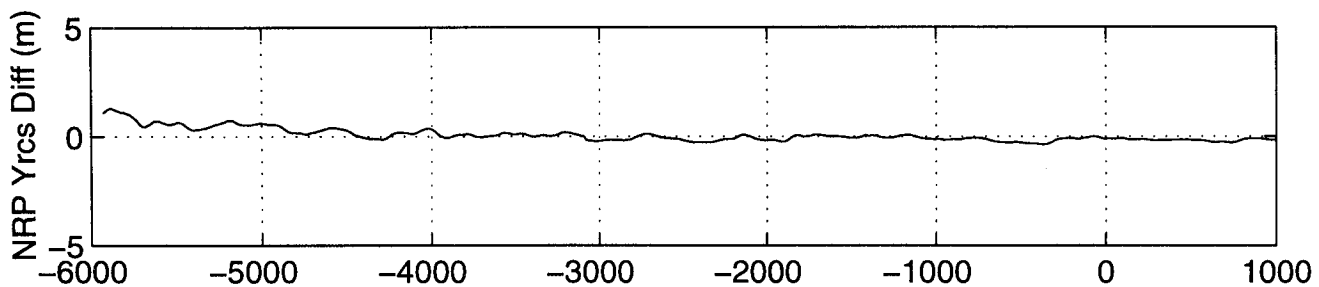
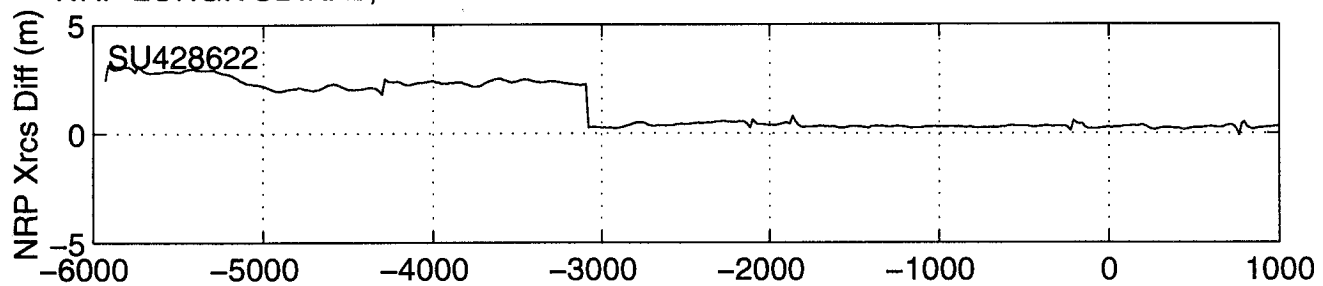
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 282.318
LGRP Yrcs POSITION (m): 1.215





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428624
START TIME: 412137.499
STOP TIME: 412243.749

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.412
NRP Yrcs MEAN DIFFERENCE (m): -0.102
NRP Zrcs MEAN DIFFERENCE (m): 0.078

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.245
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.116
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.248

NRP Xrcs 2-RMS DIFFERENCE (m): 0.859
NRP Yrcs 2-RMS DIFFERENCE (m): 0.235
NRP Zrcs 2-RMS DIFFERENCE (m): 0.293

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 134.851
LGRP Yrcs POSITION (m): 1.819

APPROACH #: SU428624
START TIME: 412137.499
STOP TIME: 412243.749

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

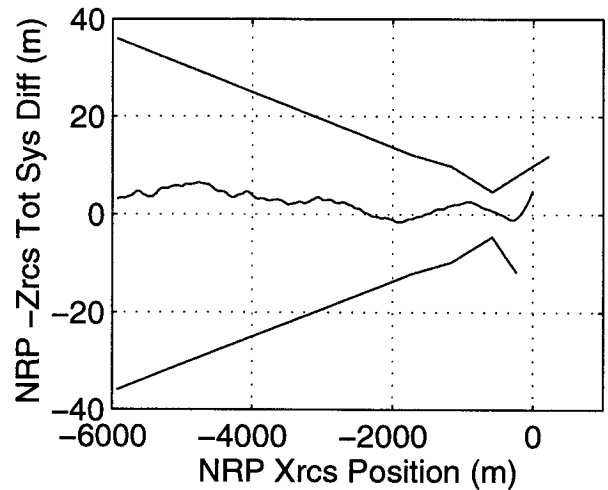
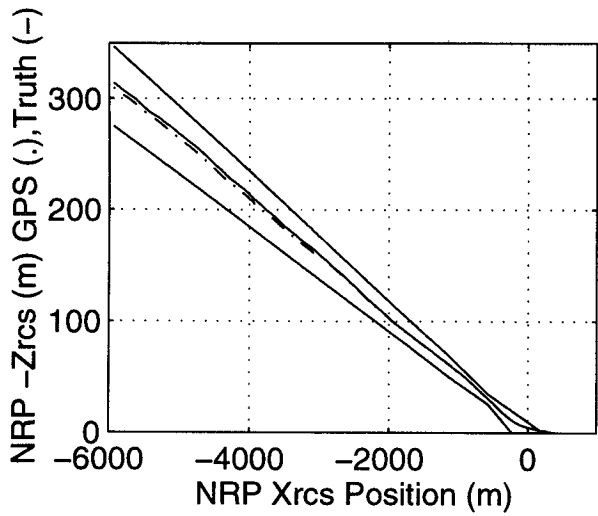
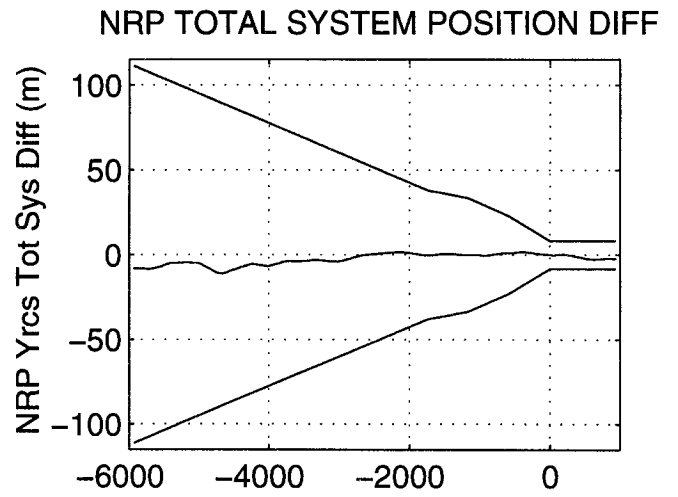
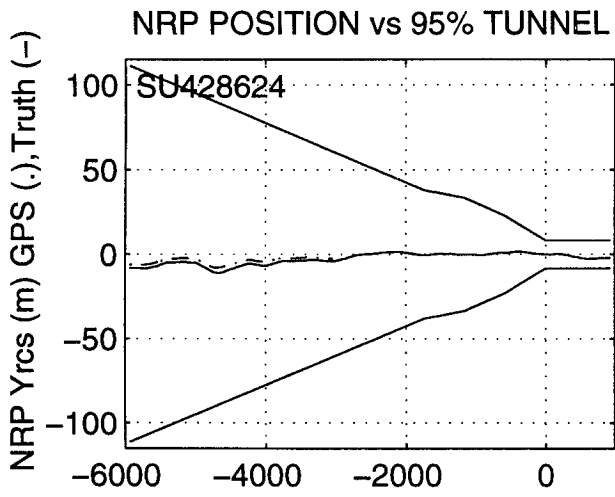
NRP Xrcs MEAN DIFFERENCE (m): 0.412
NRP Yrcs MEAN DIFFERENCE (m): -0.102
NRP Zrcs MEAN DIFFERENCE (m): 0.078

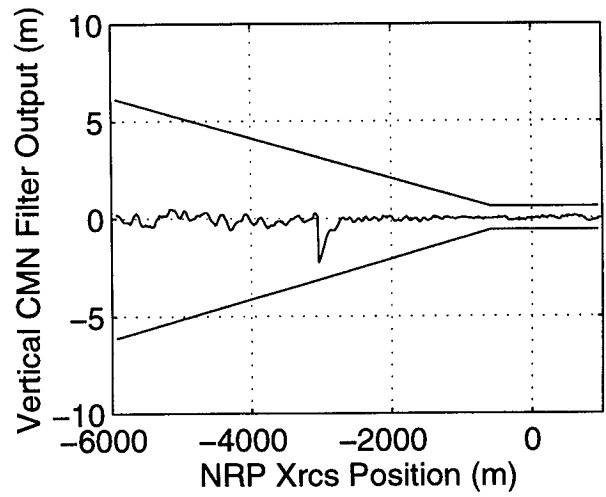
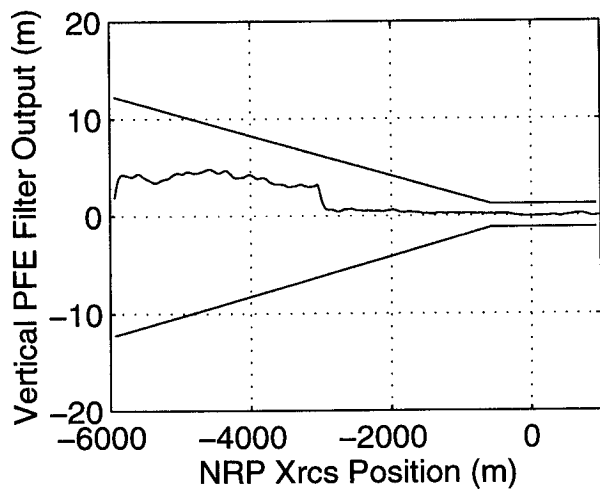
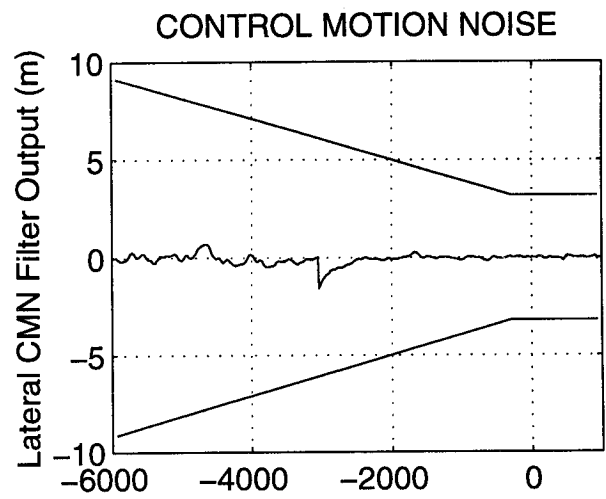
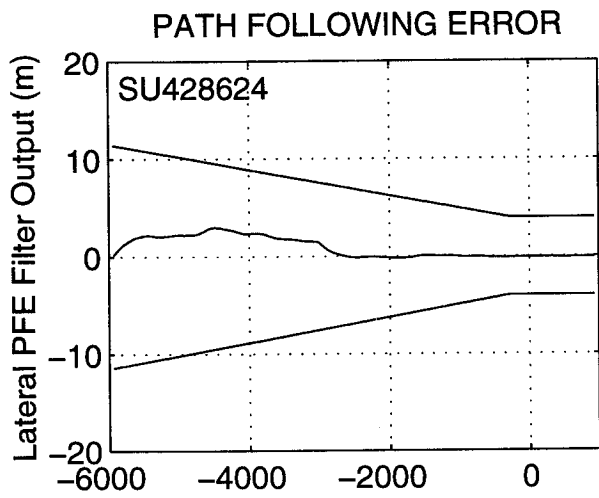
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.245
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.116
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.248

NRP Xrcs 2-RMS DIFFERENCE (m): 0.859
NRP Yrcs 2-RMS DIFFERENCE (m): 0.235
NRP Zrcs 2-RMS DIFFERENCE (m): 0.293

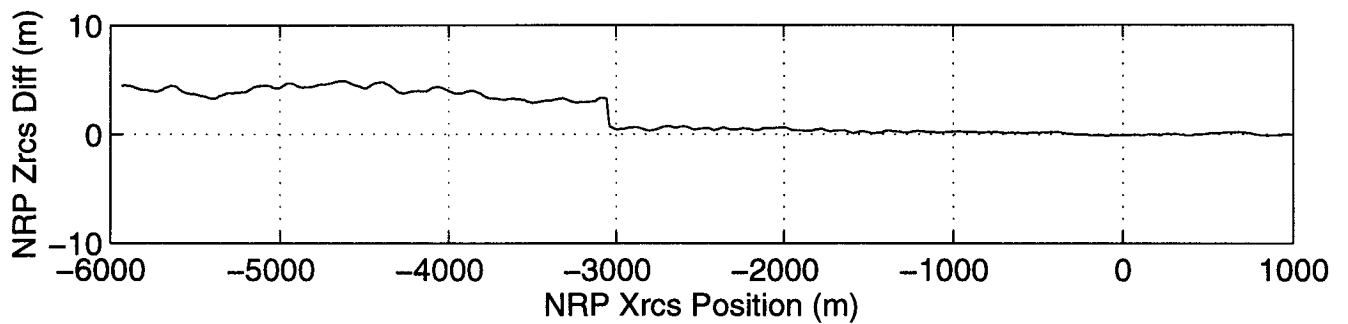
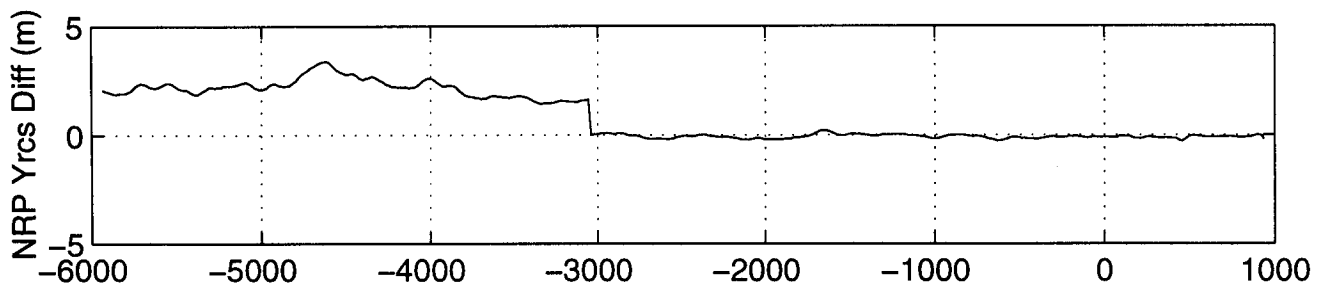
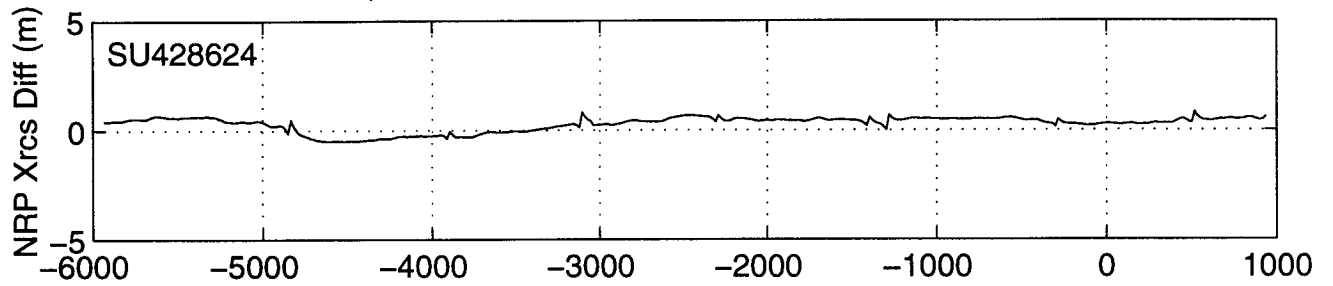
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 134.851
LGRP Yrcs POSITION (m): 1.819





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428626
START TIME: 412521.749
STOP TIME: 412627.749

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.401
NRP Yrcs MEAN DIFFERENCE (m): -0.085
NRP Zrcs MEAN DIFFERENCE (m): 0.086

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.248
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.104
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.231

NRP Xrcs 2-RMS DIFFERENCE (m): 0.840
NRP Yrcs 2-RMS DIFFERENCE (m): 0.199
NRP Zrcs 2-RMS DIFFERENCE (m): 0.287

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 312.822
LGRP Yrcs POSITION (m): 3.661

APPROACH #: SU428626
START TIME: 412521.749
STOP TIME: 412627.749

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

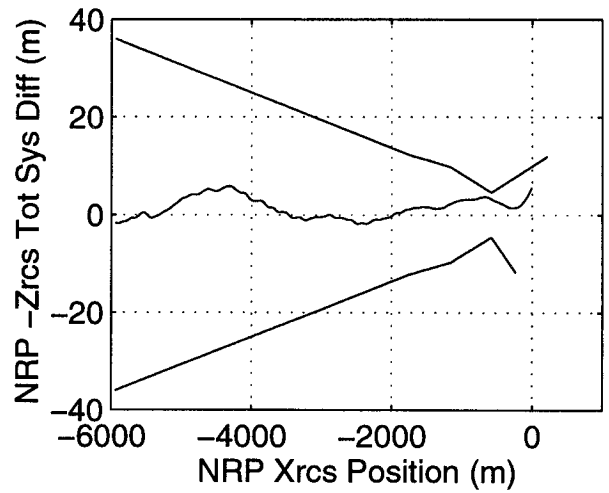
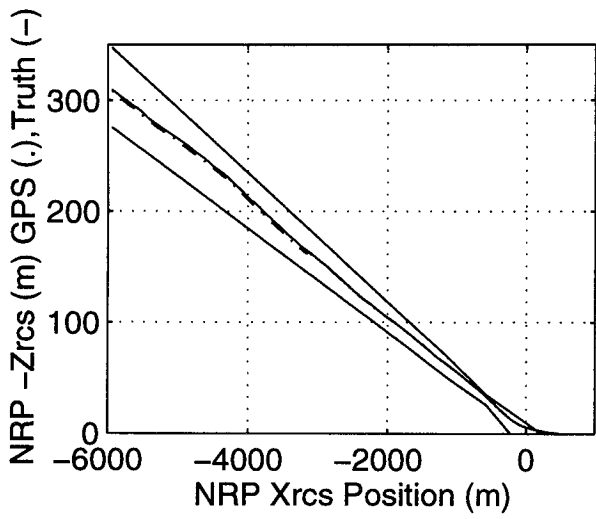
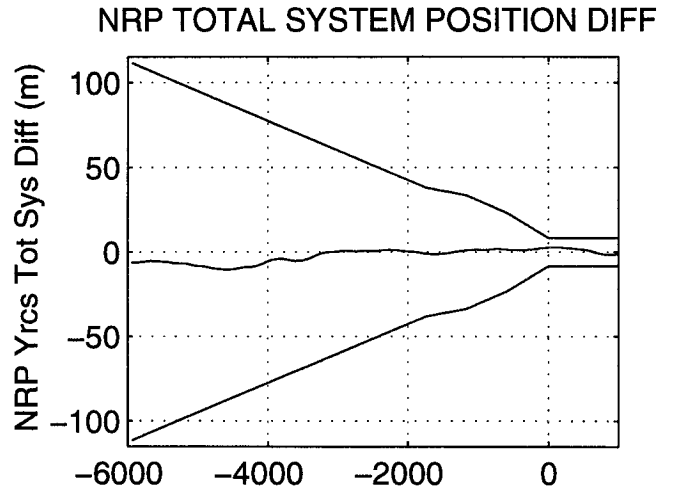
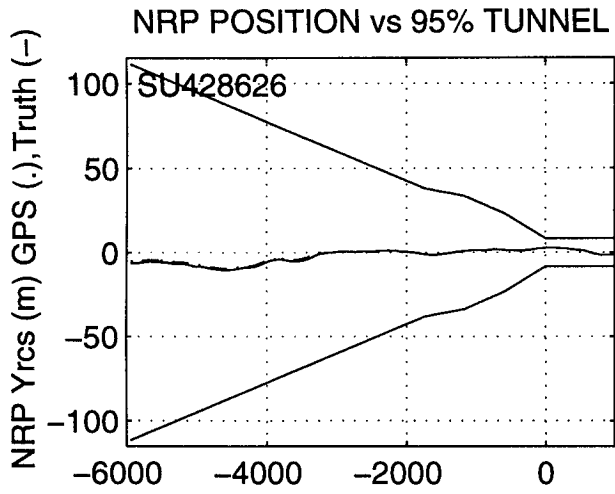
NRP Xrcs MEAN DIFFERENCE (m): 0.401
NRP Yrcs MEAN DIFFERENCE (m): -0.085
NRP Zrcs MEAN DIFFERENCE (m): 0.086

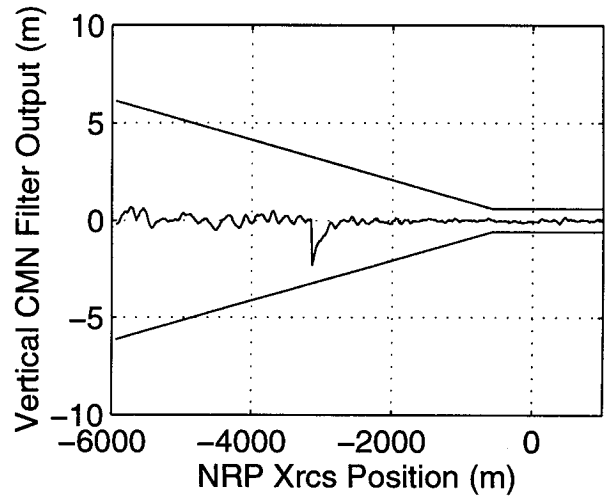
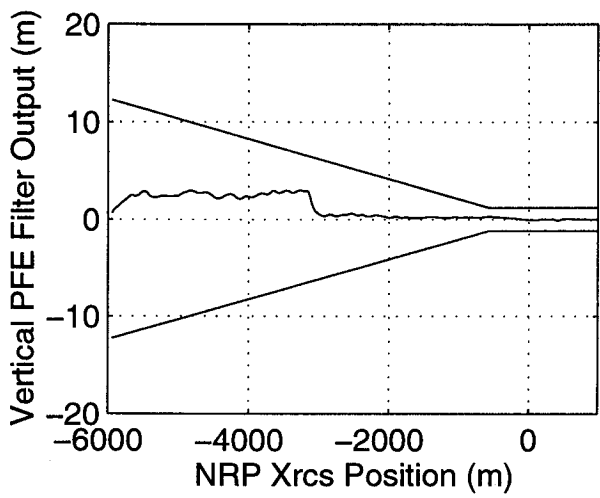
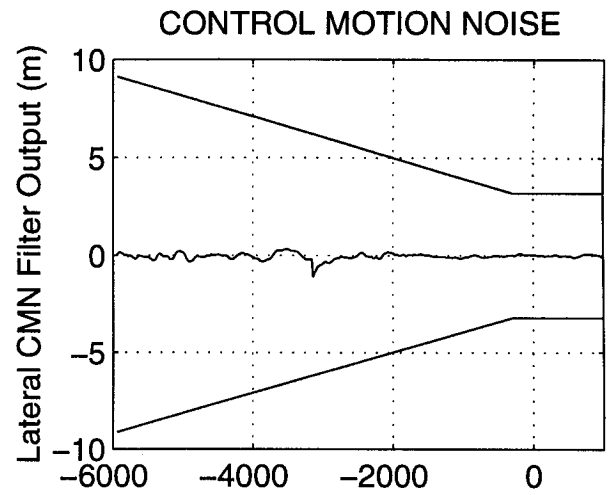
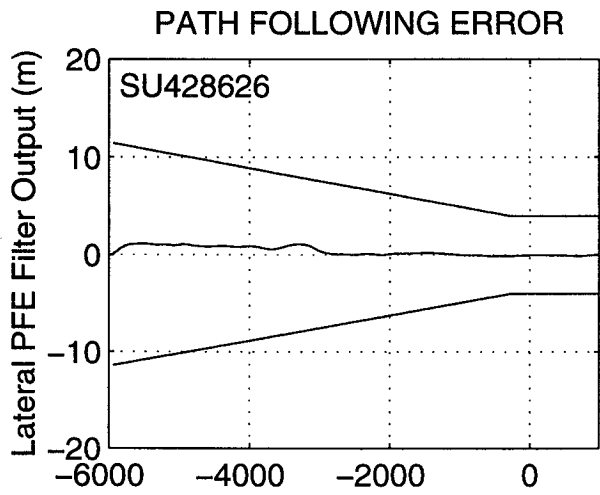
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.248
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.104
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.231

NRP Xrcs 2-RMS DIFFERENCE (m): 0.840
NRP Yrcs 2-RMS DIFFERENCE (m): 0.199
NRP Zrcs 2-RMS DIFFERENCE (m): 0.287

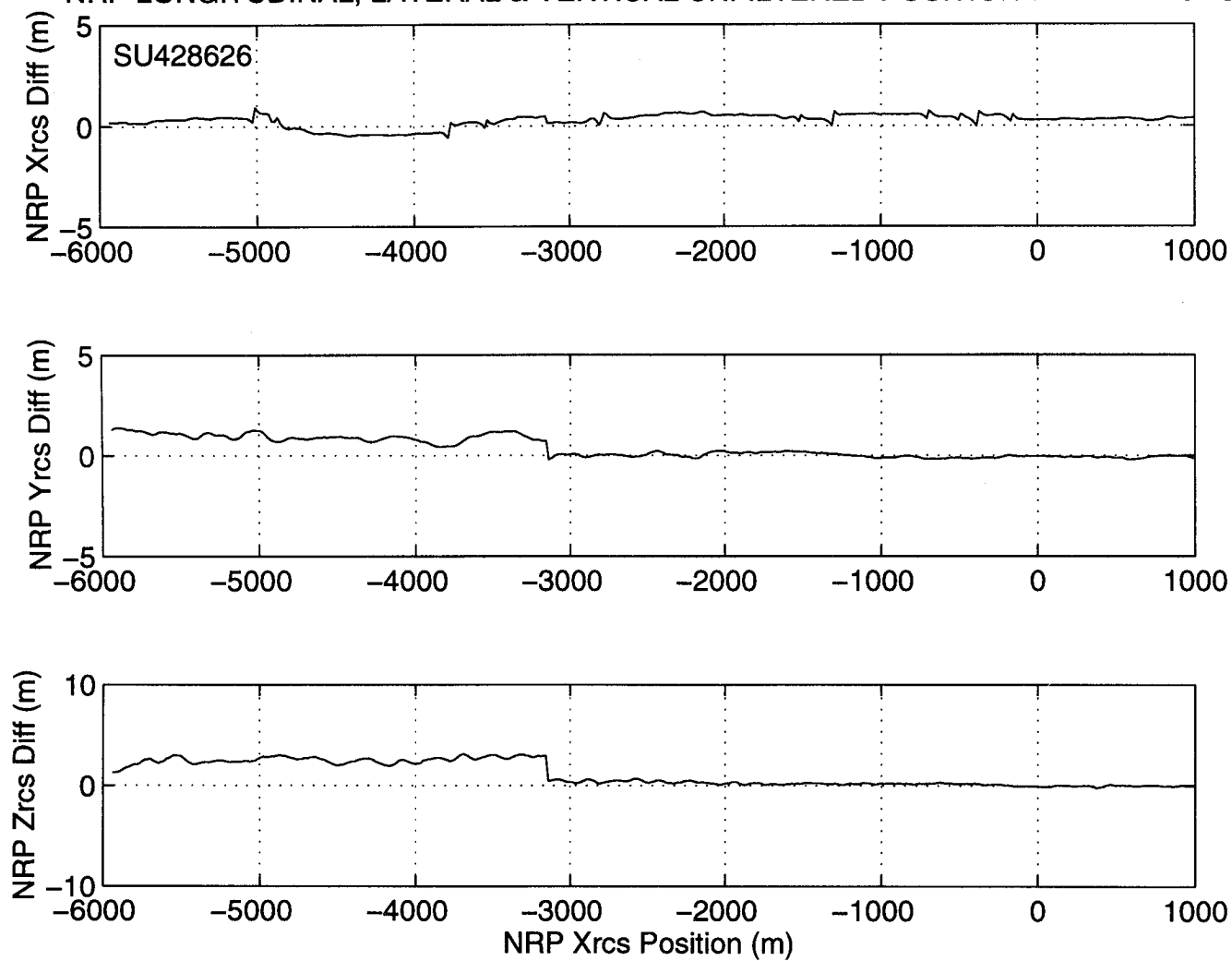
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 312.822
LGRP Yrcs POSITION (m): 3.661





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428628
START TIME: 412926.749
STOP TIME: 413034.499

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.431
NRP Yrcs MEAN DIFFERENCE (m): -0.169
NRP Zrcs MEAN DIFFERENCE (m): 0.118

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.162
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.229
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.206

NRP Xrcs 2-RMS DIFFERENCE (m): 0.877
NRP Yrcs 2-RMS DIFFERENCE (m): 0.409
NRP Zrcs 2-RMS DIFFERENCE (m): 0.314

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 125.848
LGRP Yrcs POSITION (m): 2.862

APPROACH #: SU428628
START TIME: 412926.749
STOP TIME: 413034.499

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

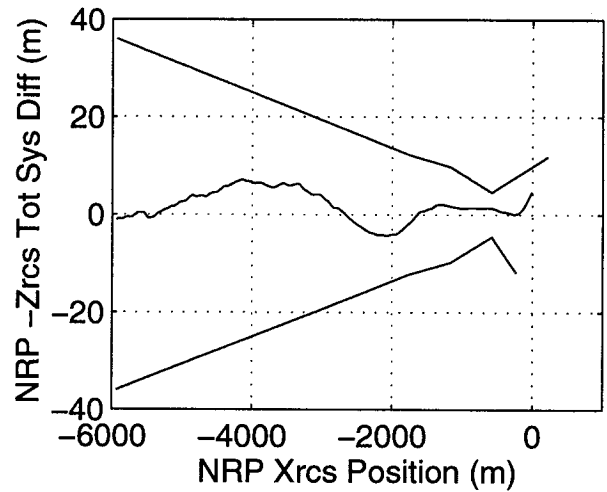
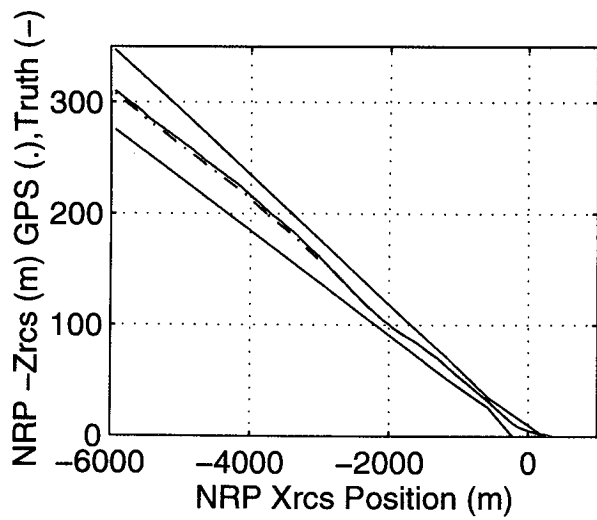
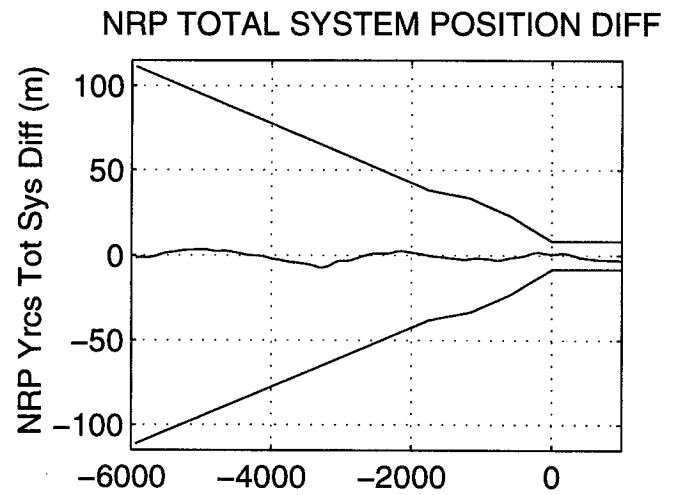
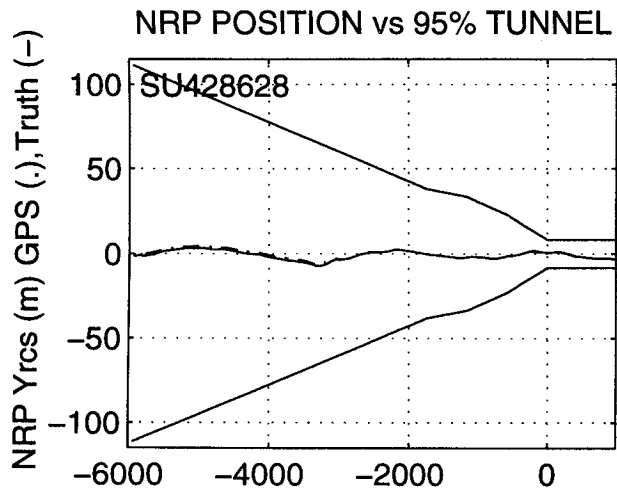
NRP Xrcs MEAN DIFFERENCE (m): 0.431
NRP Yrcs MEAN DIFFERENCE (m): -0.169
NRP Zrcs MEAN DIFFERENCE (m): 0.118

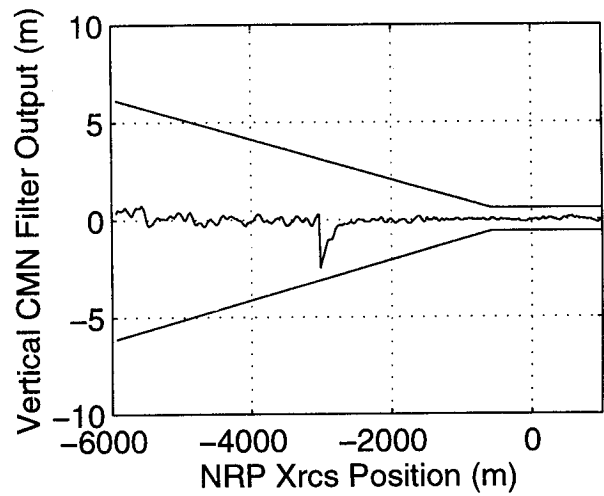
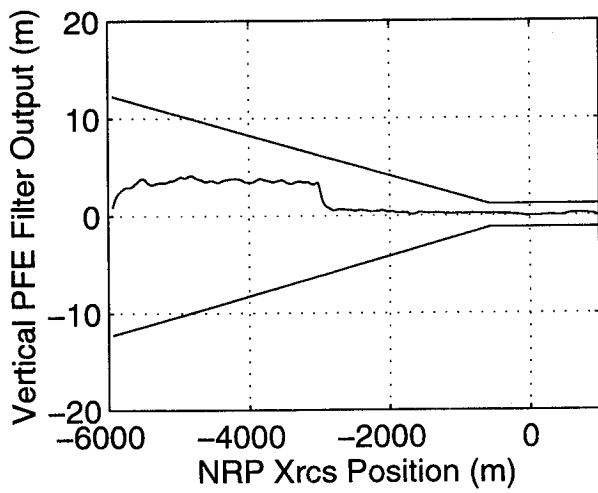
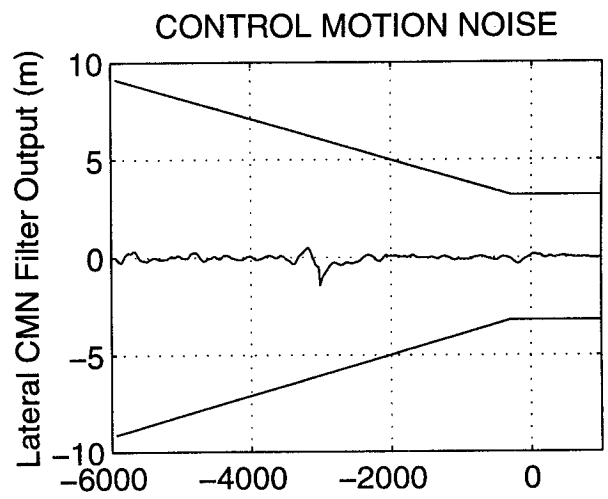
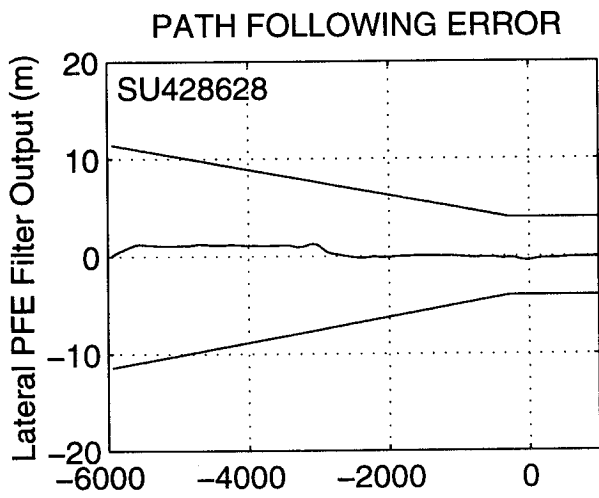
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.162
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.229
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.206

NRP Xrcs 2-RMS DIFFERENCE (m): 0.877
NRP Yrcs 2-RMS DIFFERENCE (m): 0.409
NRP Zrcs 2-RMS DIFFERENCE (m): 0.314

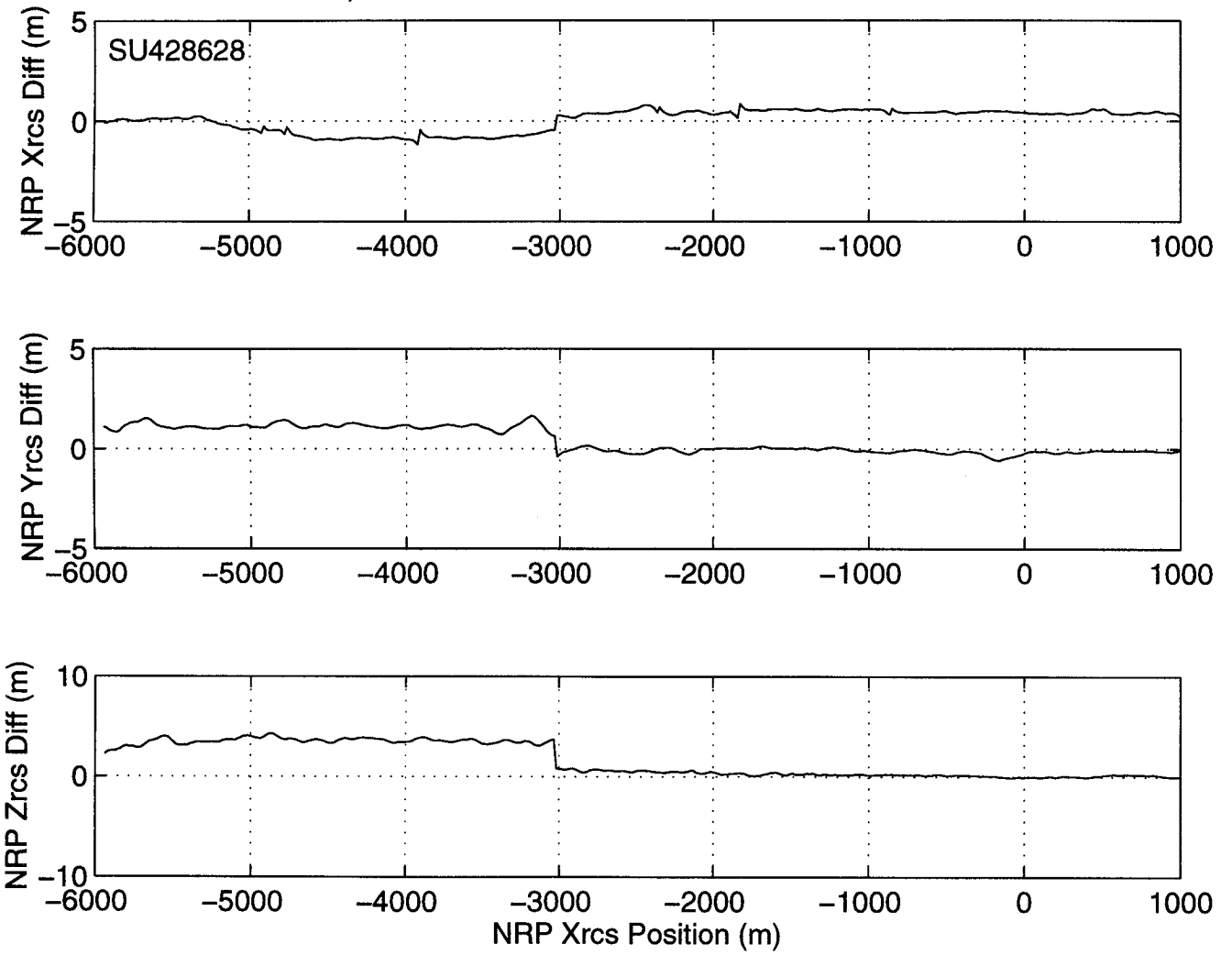
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 125.848
LGRP Yrcs POSITION (m): 2.862





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428630
START TIME: 413334.499
STOP TIME: 413444.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.325
NRP Yrcs MEAN DIFFERENCE (m): -0.090
NRP Zrcs MEAN DIFFERENCE (m): -0.070

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.179
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.156
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.222

NRP Xrcs 2-RMS DIFFERENCE (m): 0.675
NRP Yrcs 2-RMS DIFFERENCE (m): 0.238
NRP Zrcs 2-RMS DIFFERENCE (m): 0.262

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 290.016
LGRP Yrcs POSITION (m): -3.644

APPROACH #: SU428630
START TIME: 413334.499
STOP TIME: 413444.249

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

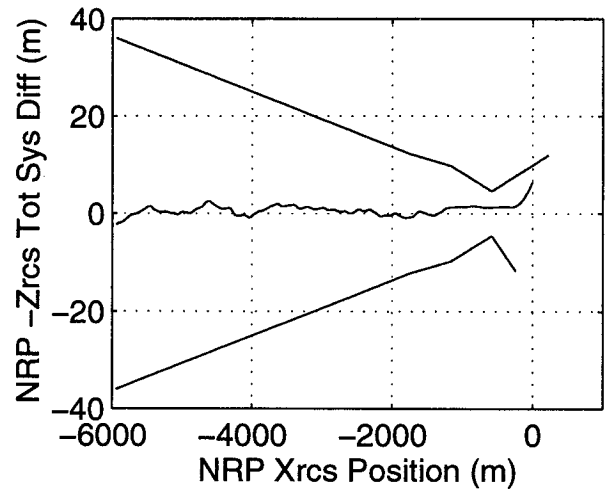
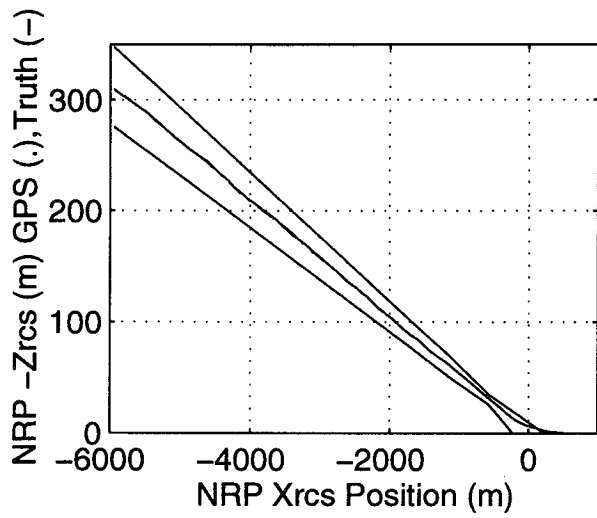
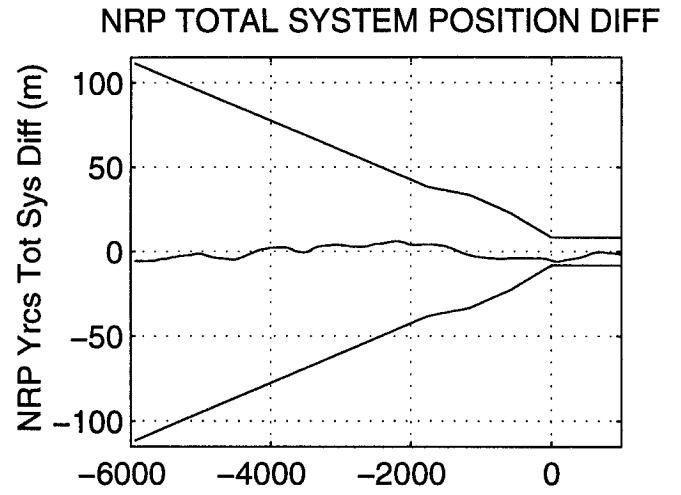
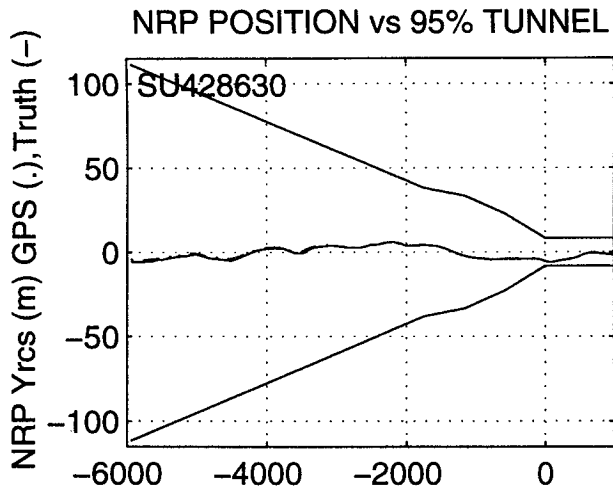
NRP Xrcs MEAN DIFFERENCE (m): 0.325
NRP Yrcs MEAN DIFFERENCE (m): -0.090
NRP Zrcs MEAN DIFFERENCE (m): -0.070

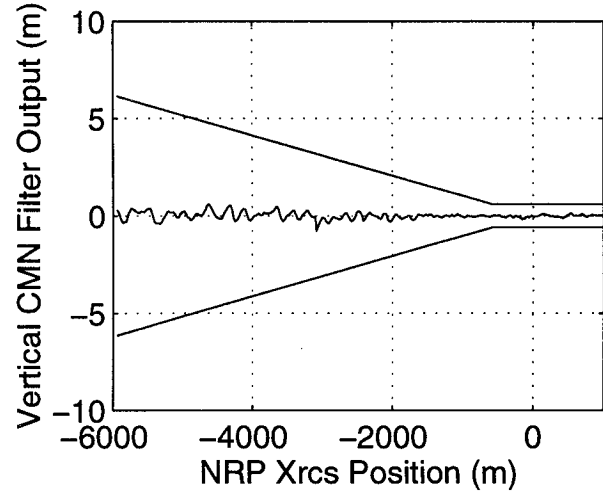
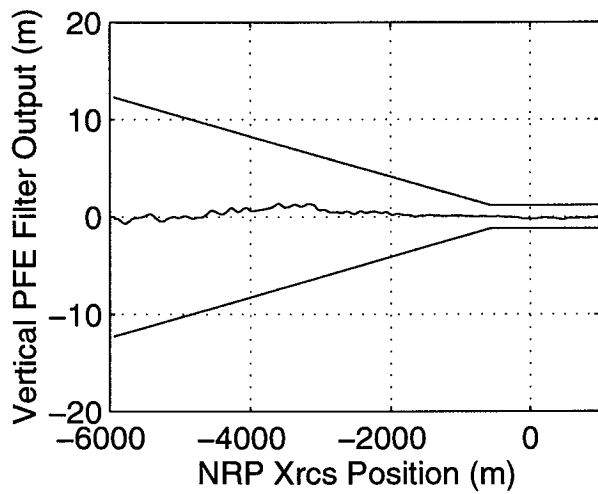
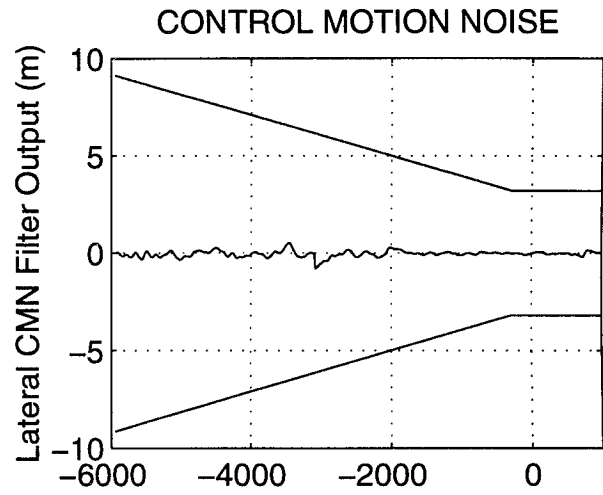
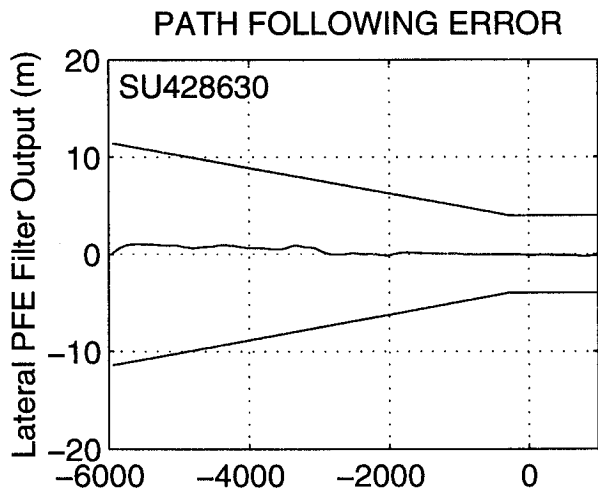
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.179
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.156
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.222

NRP Xrcs 2-RMS DIFFERENCE (m): 0.675
NRP Yrcs 2-RMS DIFFERENCE (m): 0.238
NRP Zrcs 2-RMS DIFFERENCE (m): 0.262

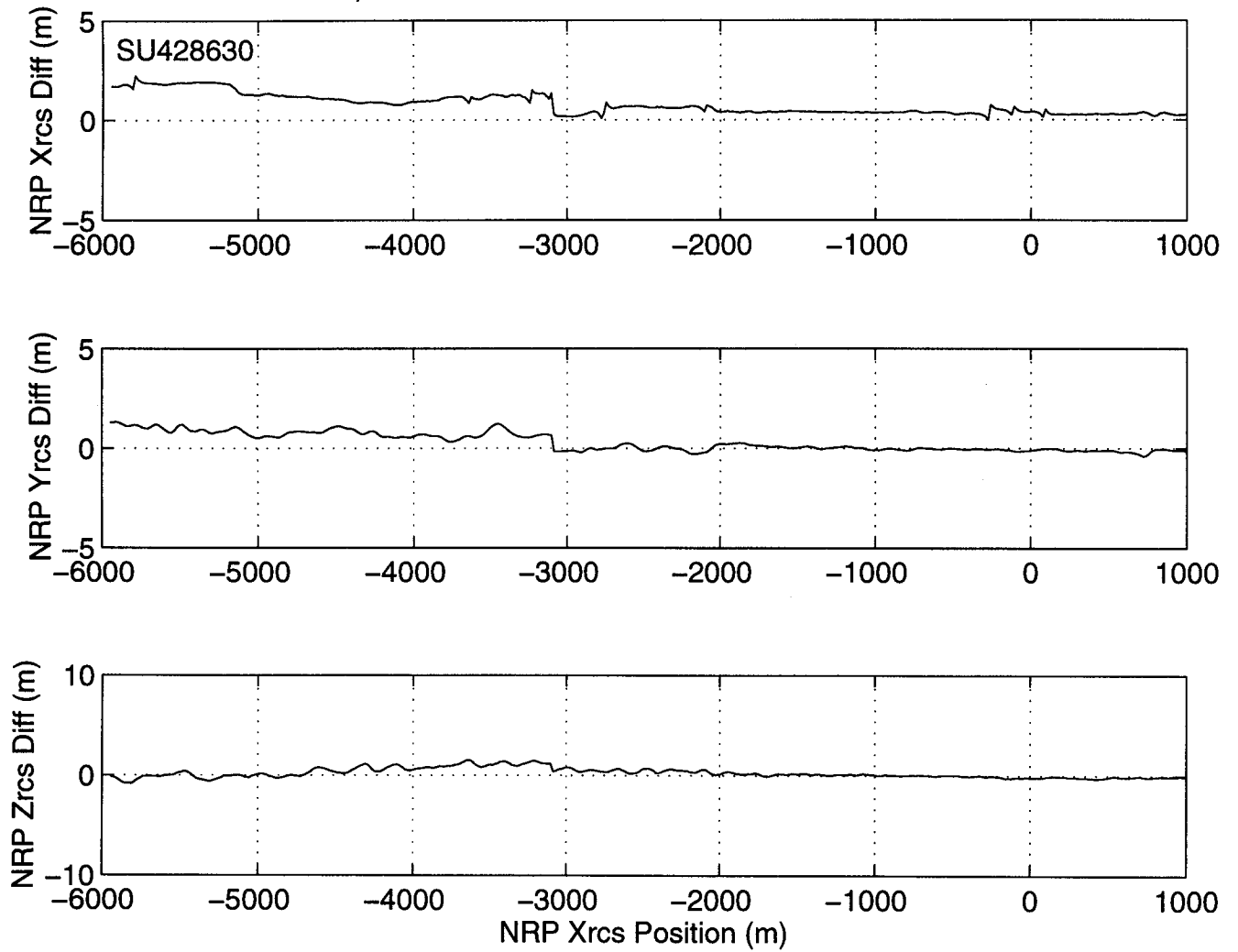
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 290.016
LGRP Yrcs POSITION (m): -3.644





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428632
START TIME: 413727.749
STOP TIME: 413835.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.406
NRP Yrcs MEAN DIFFERENCE (m): -0.151
NRP Zrcs MEAN DIFFERENCE (m): 0.000

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.233
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.243

NRP Xrcs 2-RMS DIFFERENCE (m): 0.844
NRP Yrcs 2-RMS DIFFERENCE (m): 0.362
NRP Zrcs 2-RMS DIFFERENCE (m): 0.243

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 214.967
LGRP Yrcs POSITION (m): 0.654

APPROACH #: SU428632
START TIME: 413727.749
STOP TIME: 413835.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

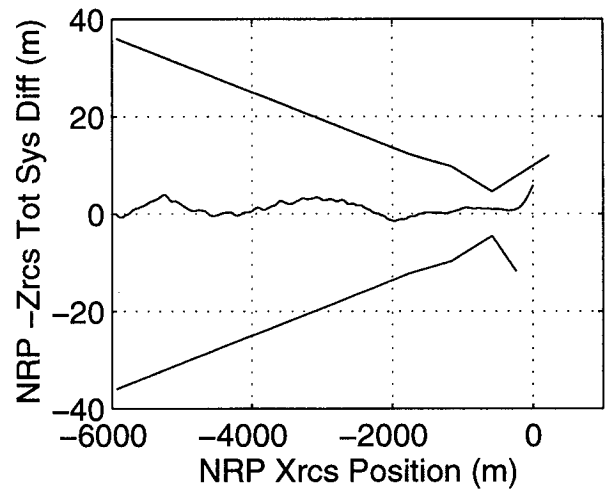
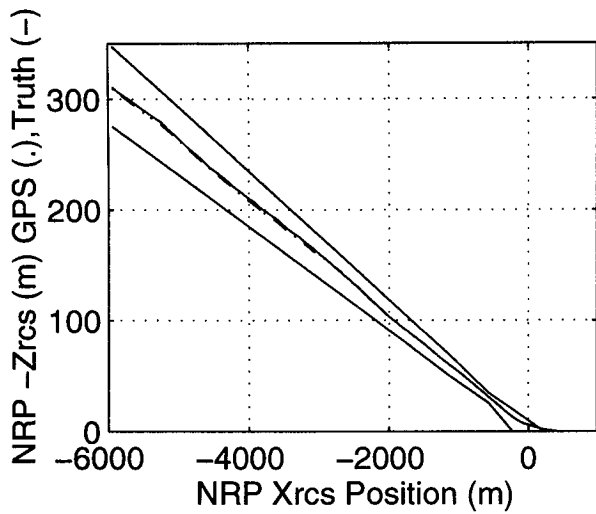
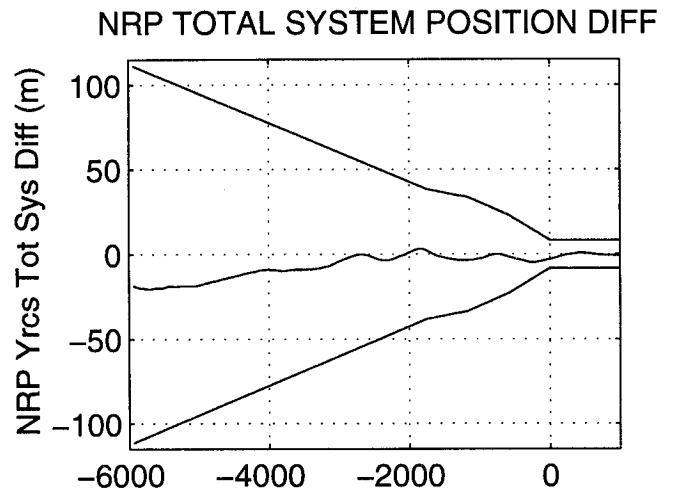
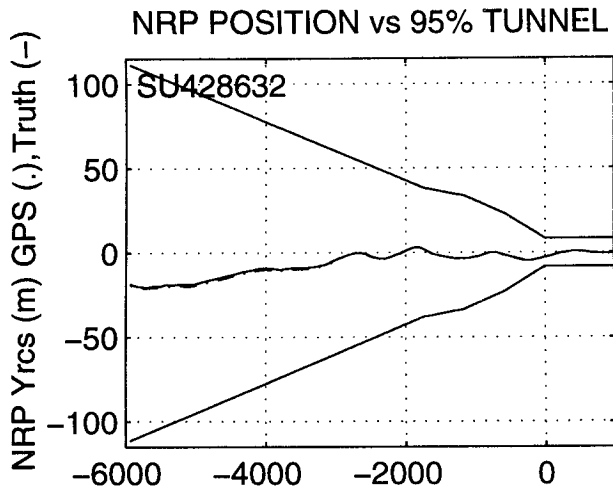
NRP Xrcs MEAN DIFFERENCE (m): 0.406
NRP Yrcs MEAN DIFFERENCE (m): -0.151
NRP Zrcs MEAN DIFFERENCE (m): 0.000

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.233
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.243

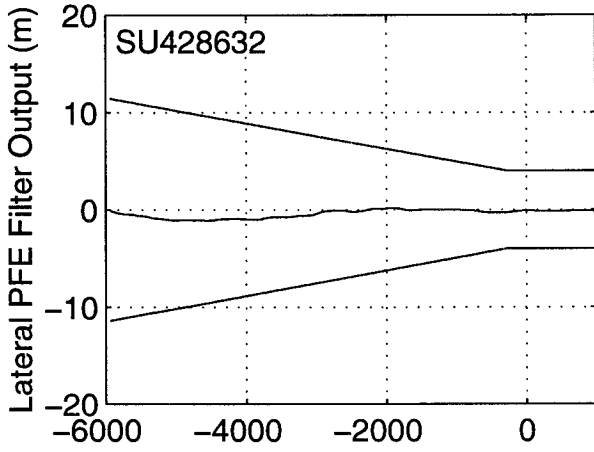
NRP Xrcs 2-RMS DIFFERENCE (m): 0.844
NRP Yrcs 2-RMS DIFFERENCE (m): 0.362
NRP Zrcs 2-RMS DIFFERENCE (m): 0.243

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

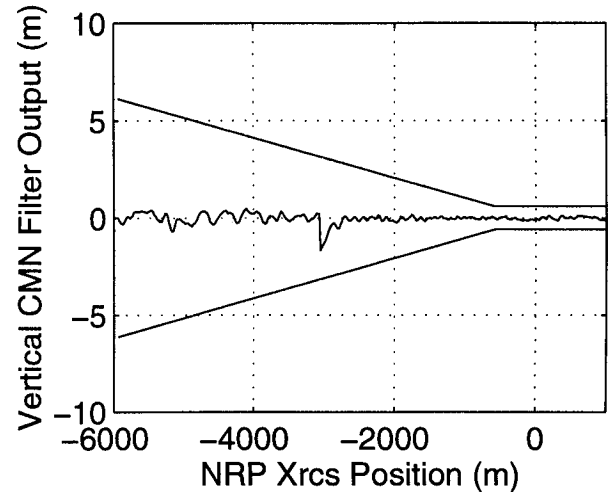
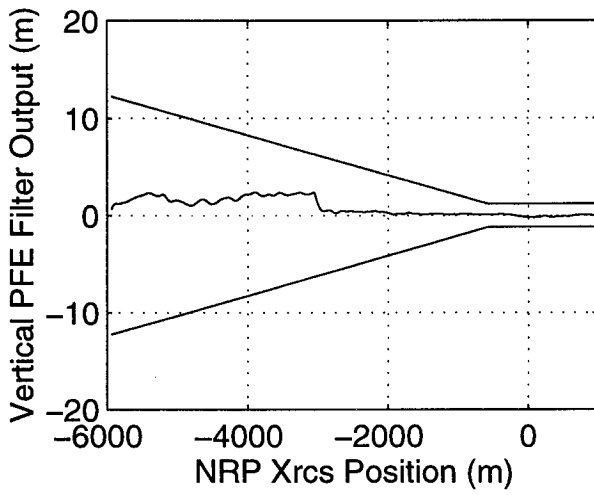
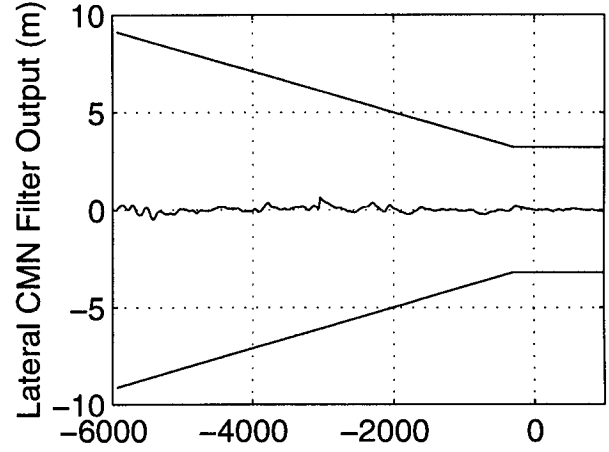
LGRP Xrcs POSITION (m): 214.967
LGRP Yrcs POSITION (m): 0.654



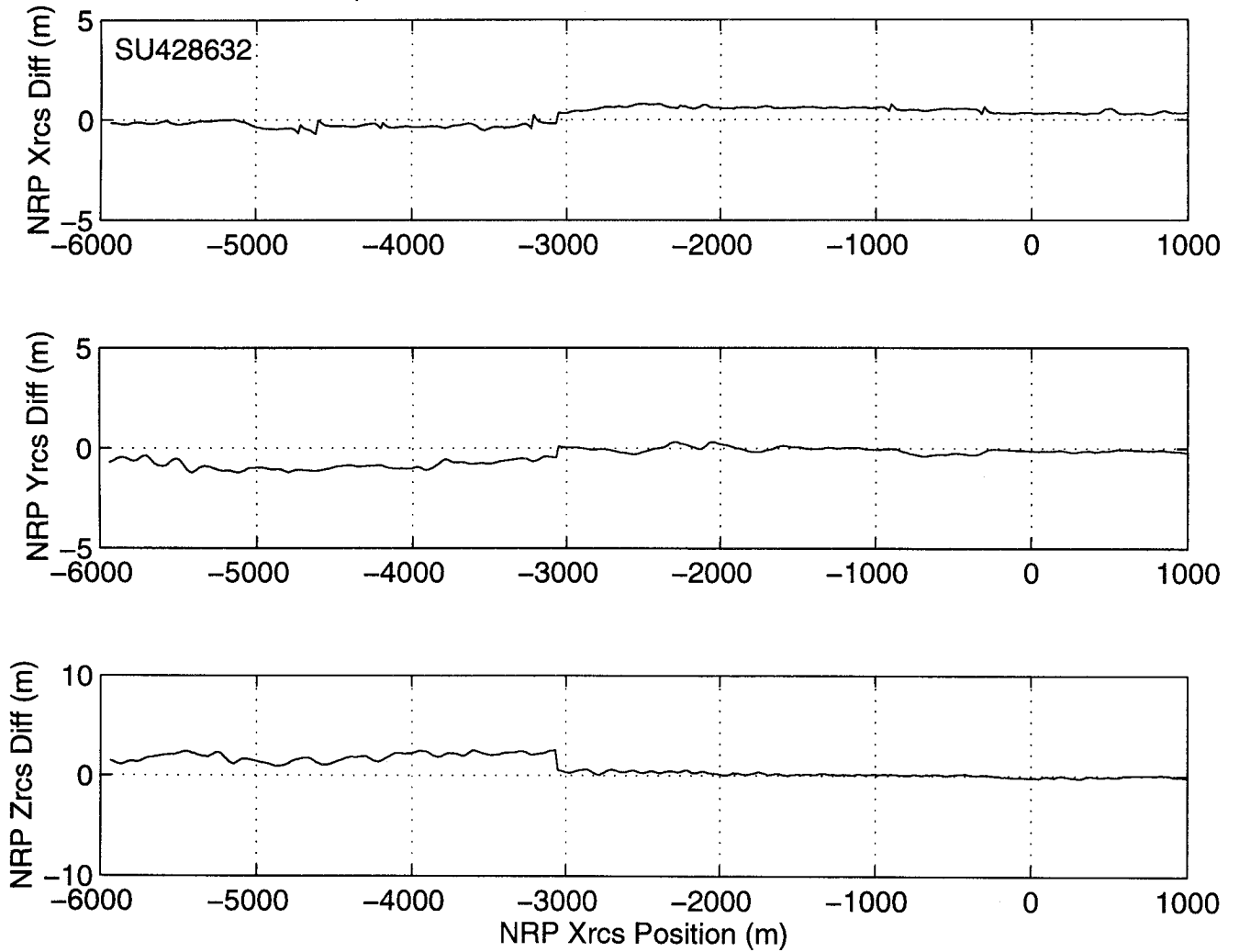
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428634
START TIME: 414109.249
STOP TIME: 414216.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.4
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.465
NRP Yrcs MEAN DIFFERENCE (m): -0.146
NRP Zrcs MEAN DIFFERENCE (m): 0.019

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.181
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.235
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.225

NRP Xrcs 2-RMS DIFFERENCE (m): 0.947
NRP Yrcs 2-RMS DIFFERENCE (m): 0.375
NRP Zrcs 2-RMS DIFFERENCE (m): 0.228

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 86.153
LGRP Yrcs POSITION (m): 2.935

APPROACH #: SU428634
START TIME: 414109.249
STOP TIME: 414216.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.4
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

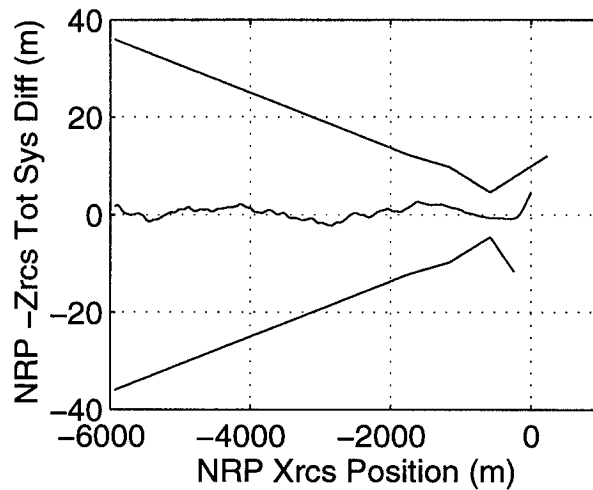
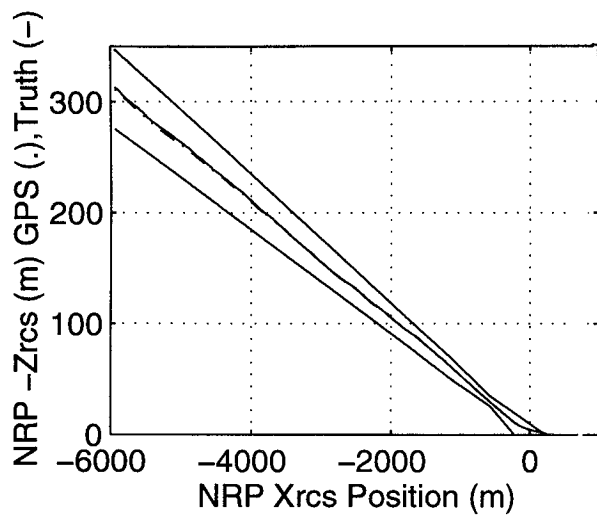
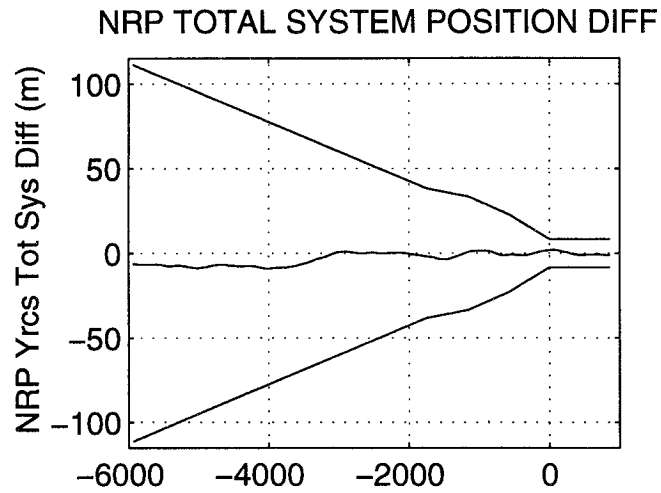
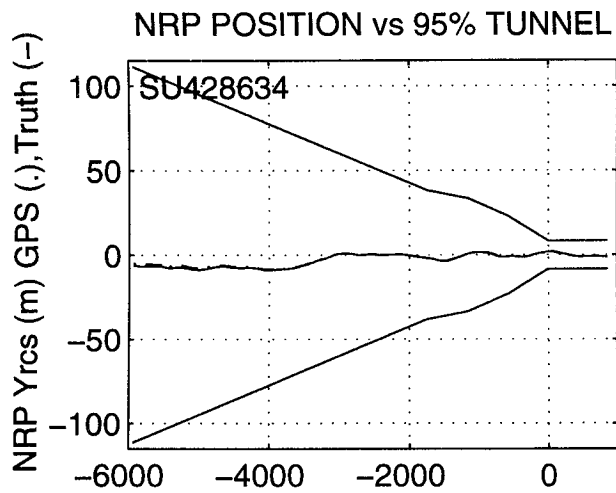
NRP Xrcs MEAN DIFFERENCE (m): 0.465
NRP Yrcs MEAN DIFFERENCE (m): -0.146
NRP Zrcs MEAN DIFFERENCE (m): 0.019

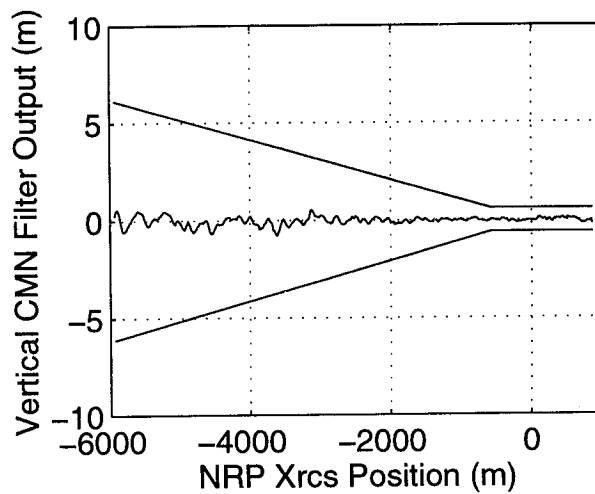
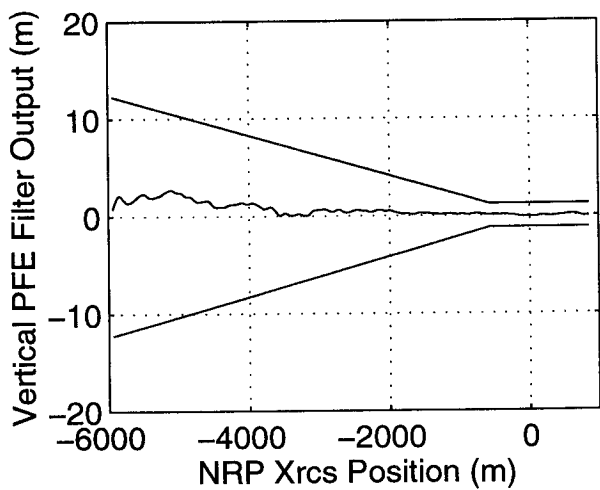
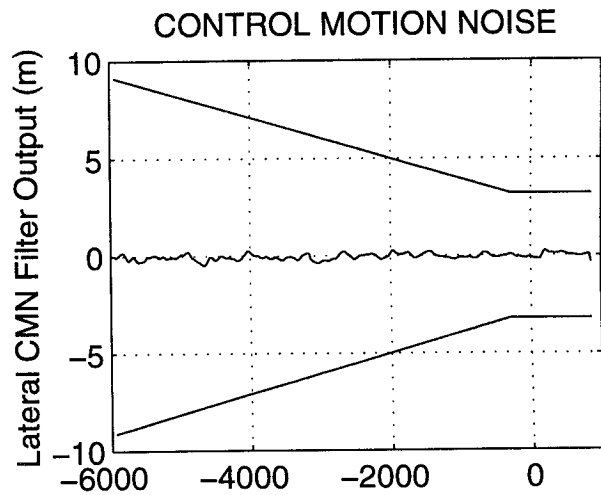
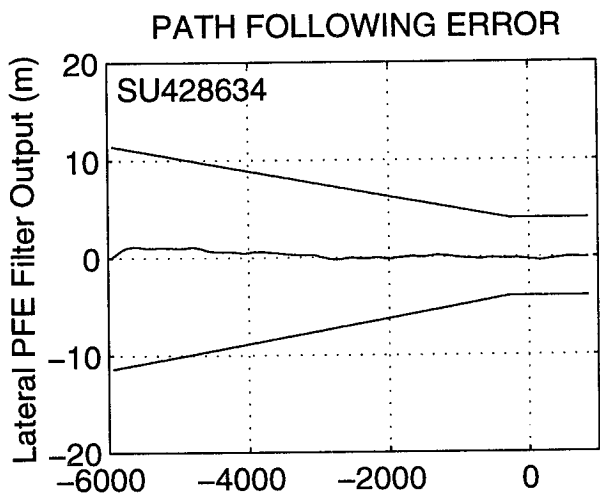
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.181
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.235
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.225

NRP Xrcs 2-RMS DIFFERENCE (m): 0.947
NRP Yrcs 2-RMS DIFFERENCE (m): 0.375
NRP Zrcs 2-RMS DIFFERENCE (m): 0.228

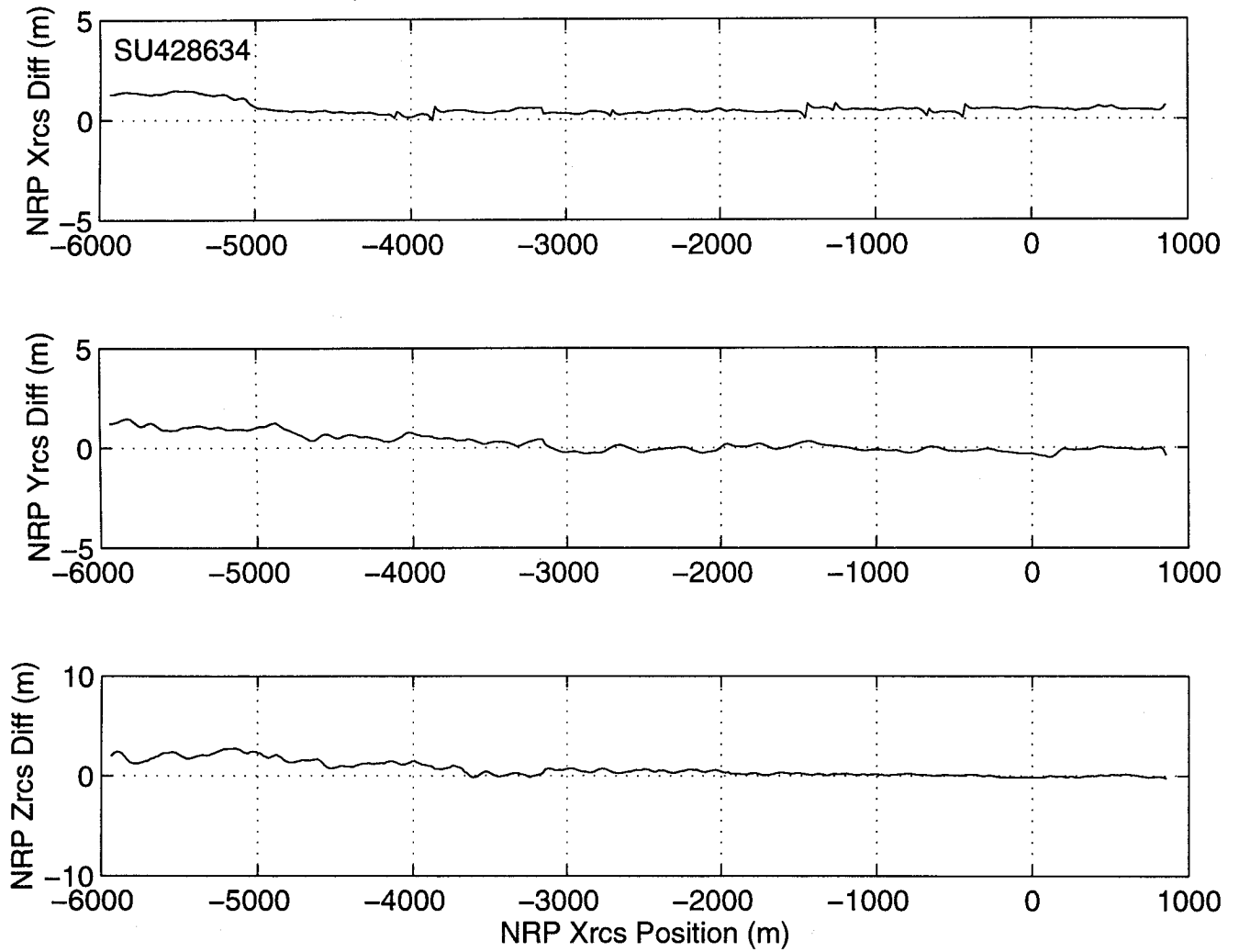
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 86.153
LGRP Yrcs POSITION (m): 2.935





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428636
START TIME: 414492.749
STOP TIME: 414601.999

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.6
AVERAGE VDOP: 5.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.410
NRP Yrcs MEAN DIFFERENCE (m): -0.037
NRP Zrcs MEAN DIFFERENCE (m): 0.067

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.237
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.190
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.221

NRP Xrcs 2-RMS DIFFERENCE (m): 0.854
NRP Yrcs 2-RMS DIFFERENCE (m): 0.204
NRP Zrcs 2-RMS DIFFERENCE (m): 0.259

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 141.721
LGRP Yrcs POSITION (m): 3.232

APPROACH #: SU428636
START TIME: 414492.749
STOP TIME: 414601.999

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 3.0
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.6
AVERAGE VDOP: 5.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

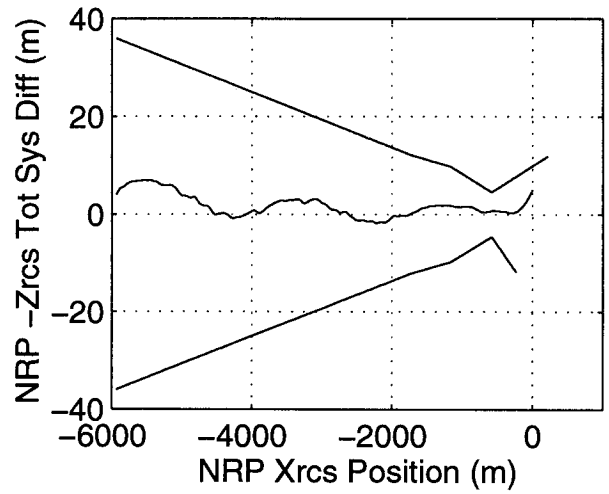
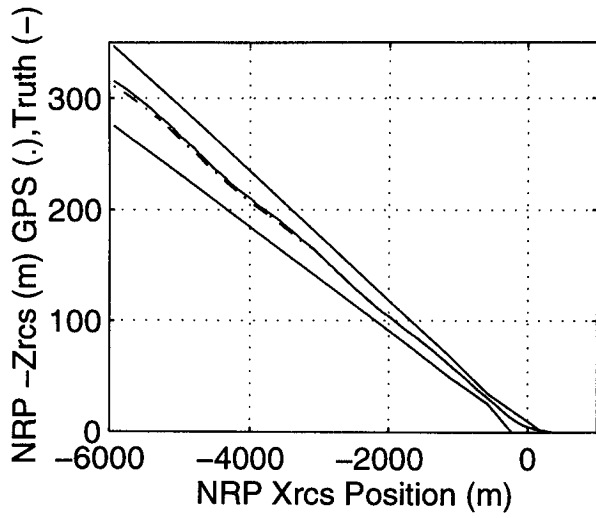
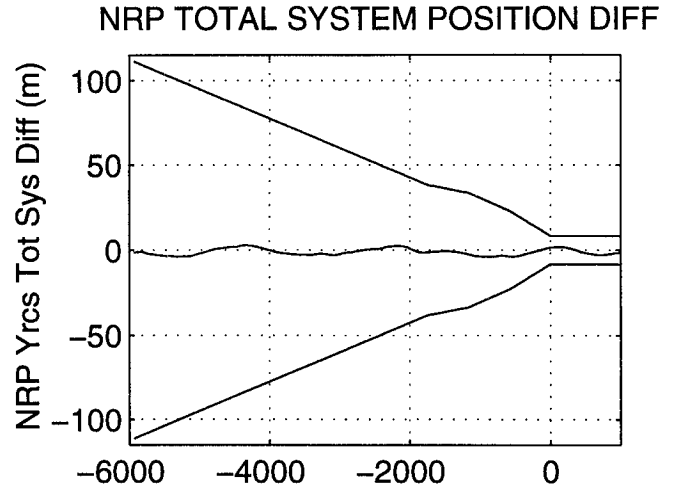
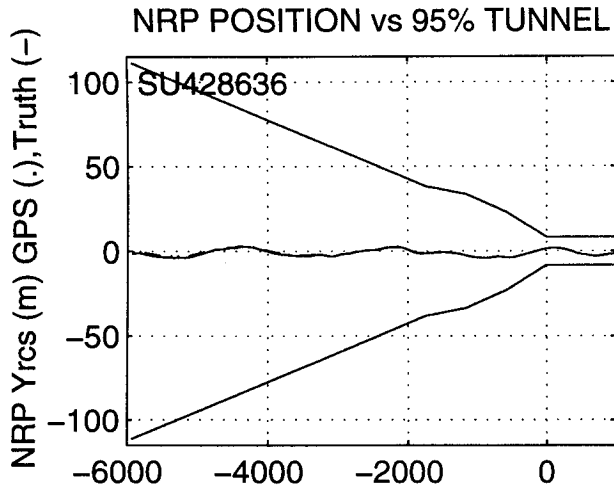
NRP Xrcs MEAN DIFFERENCE (m): 0.410
NRP Yrcs MEAN DIFFERENCE (m): -0.037
NRP Zrcs MEAN DIFFERENCE (m): 0.067

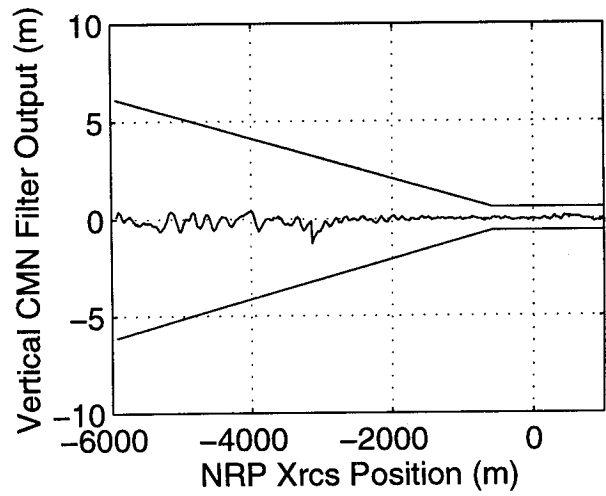
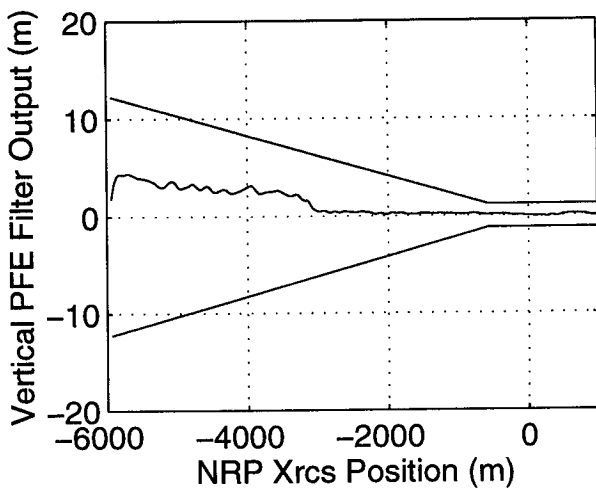
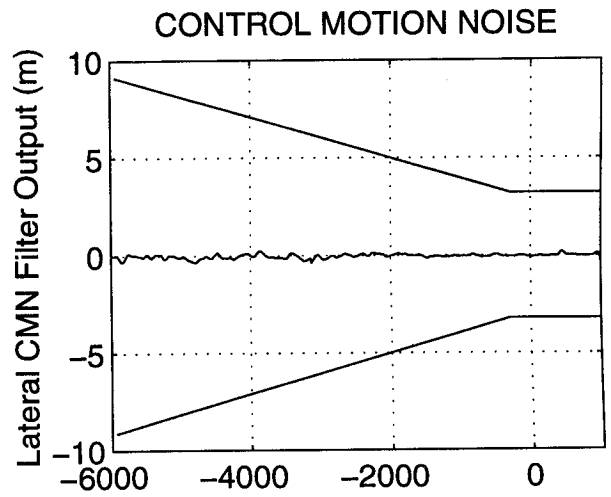
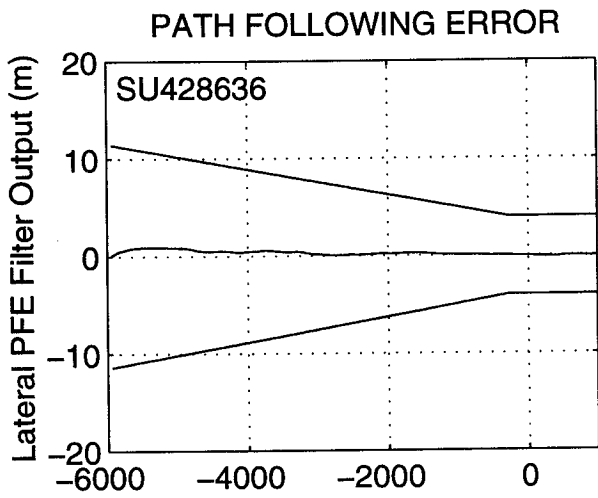
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.237
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.190
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.221

NRP Xrcs 2-RMS DIFFERENCE (m): 0.854
NRP Yrcs 2-RMS DIFFERENCE (m): 0.204
NRP Zrcs 2-RMS DIFFERENCE (m): 0.259

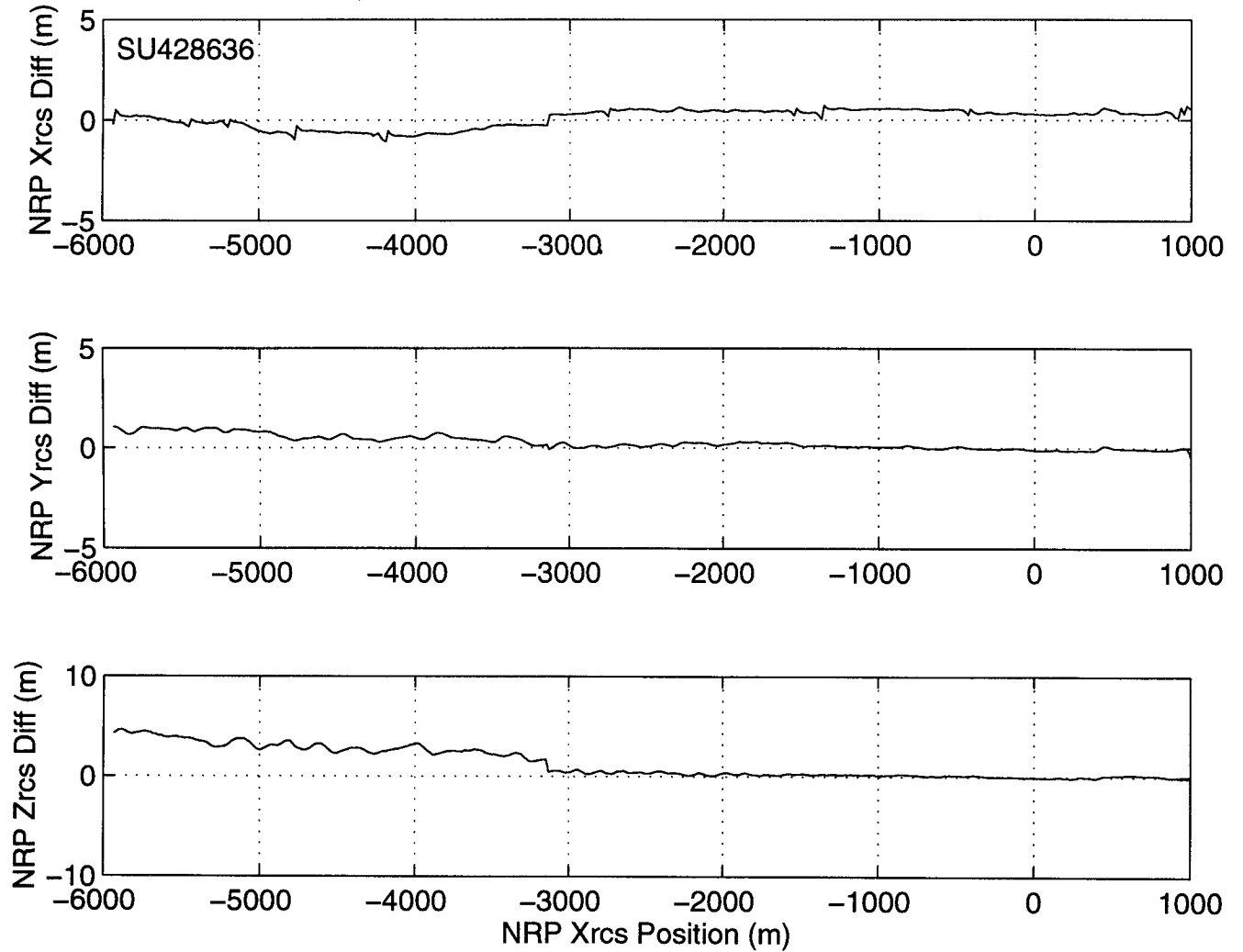
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 141.721
LGRP Yrcs POSITION (m): 3.232





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428638
START TIME: 414898.749
STOP TIME: 415011.999

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 5.8
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.469
NRP Yrcs MEAN DIFFERENCE (m): -0.105
NRP Zrcs MEAN DIFFERENCE (m): 0.171

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.240
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.270
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.231

NRP Xrcs 2-RMS DIFFERENCE (m): 0.968
NRP Yrcs 2-RMS DIFFERENCE (m): 0.342
NRP Zrcs 2-RMS DIFFERENCE (m): 0.413

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 140.772
LGRP Yrcs POSITION (m): 1.396

APPROACH #: SU428638
START TIME: 414898.749
STOP TIME: 415011.999

MINIMUM HDOP: 3.1
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.1

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 5.8
AVERAGE VDOP: 5.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

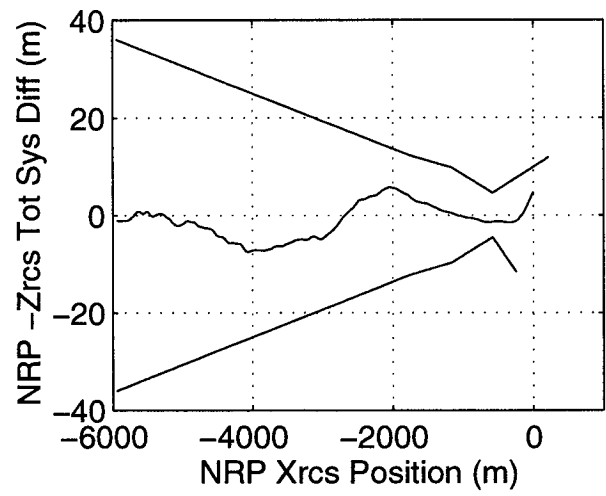
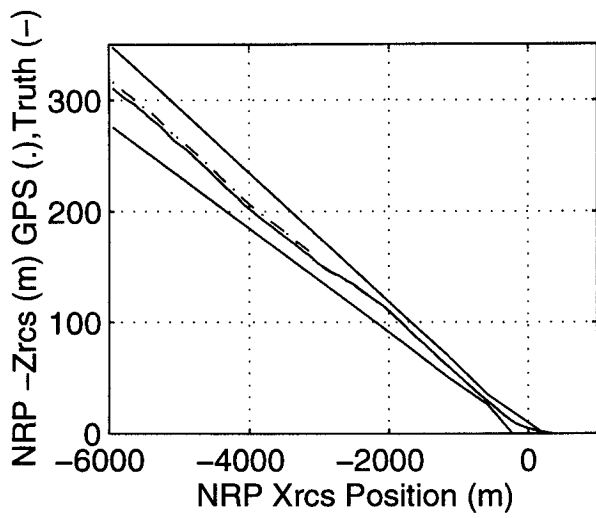
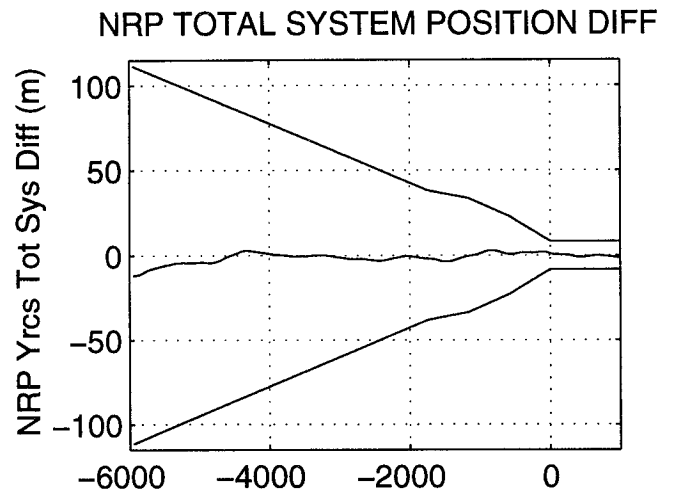
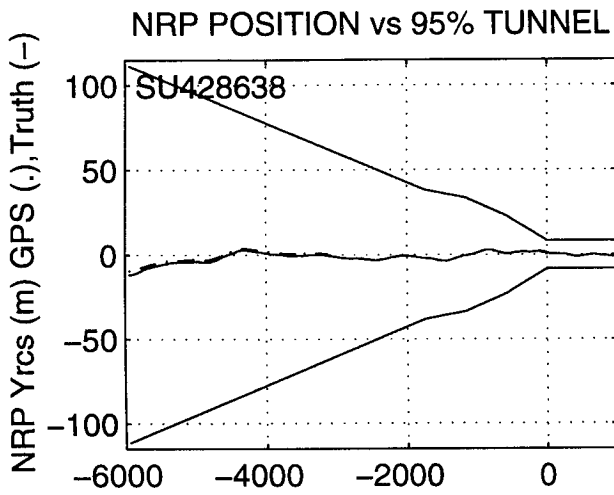
NRP Xrcs MEAN DIFFERENCE (m): 0.469
NRP Yrcs MEAN DIFFERENCE (m): -0.105
NRP Zrcs MEAN DIFFERENCE (m): 0.171

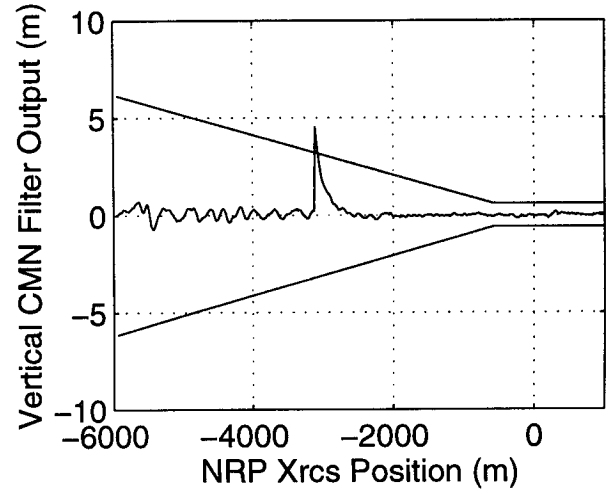
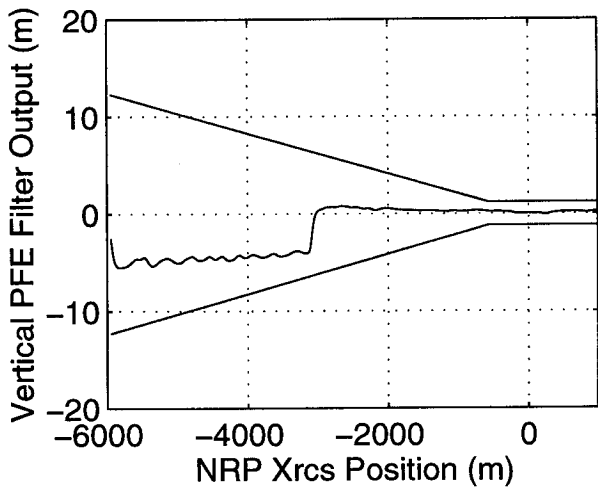
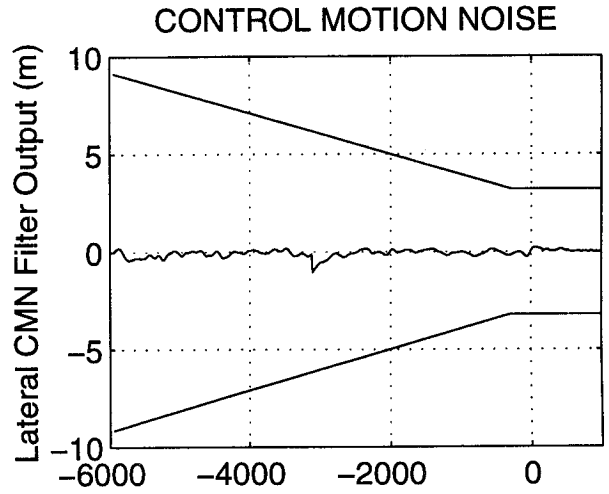
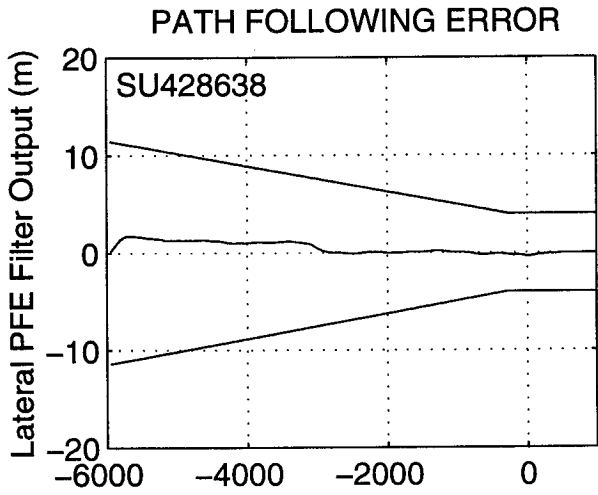
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.240
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.270
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.231

NRP Xrcs 2-RMS DIFFERENCE (m): 0.968
NRP Yrcs 2-RMS DIFFERENCE (m): 0.342
NRP Zrcs 2-RMS DIFFERENCE (m): 0.413

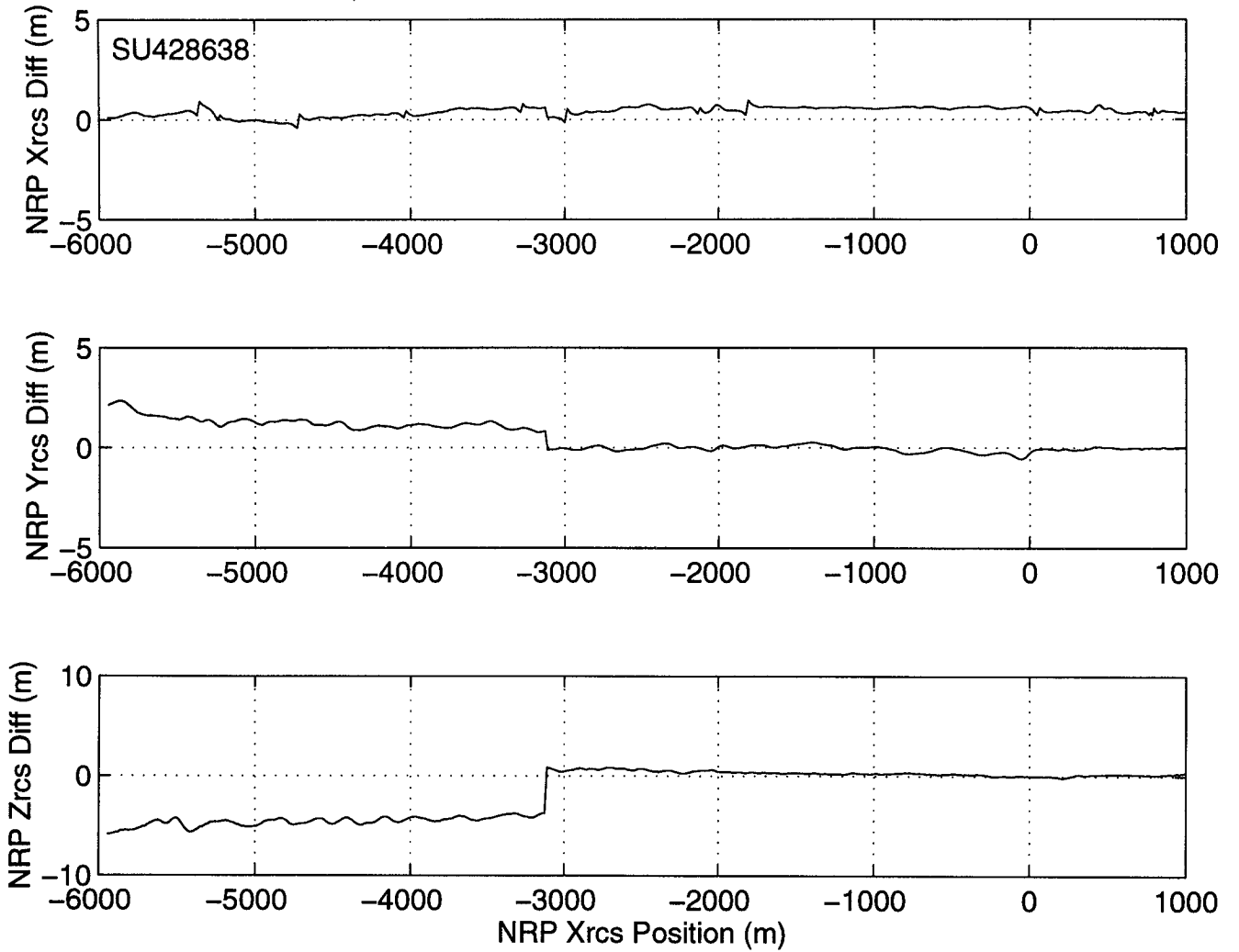
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 140.772
LGRP Yrcs POSITION (m): 1.396





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428640
START TIME: 415894.999
STOP TIME: 416013.749

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 3.8
AVERAGE HDOP: 3.7

MINIMUM VDOP: 7.2
MAXIMUM VDOP: 7.5
AVERAGE VDOP: 7.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.421
NRP Yrcs MEAN DIFFERENCE (m): -0.142
NRP Zrcs MEAN DIFFERENCE (m): 0.045

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.210
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.220
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.210

NRP Xrcs 2-RMS DIFFERENCE (m): 0.867
NRP Yrcs 2-RMS DIFFERENCE (m): 0.359
NRP Zrcs 2-RMS DIFFERENCE (m): 0.228

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 212.619
LGRP Yrcs POSITION (m): -3.203

APPROACH #: SU428640
START TIME: 415894.999
STOP TIME: 416013.749

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 3.8
AVERAGE HDOP: 3.7

MINIMUM VDOP: 7.2
MAXIMUM VDOP: 7.5
AVERAGE VDOP: 7.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

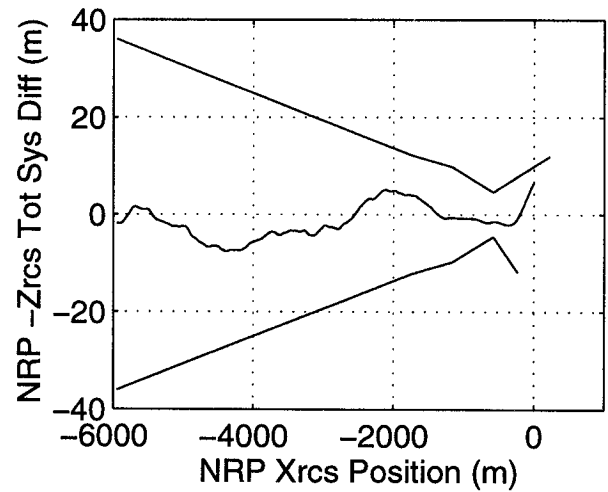
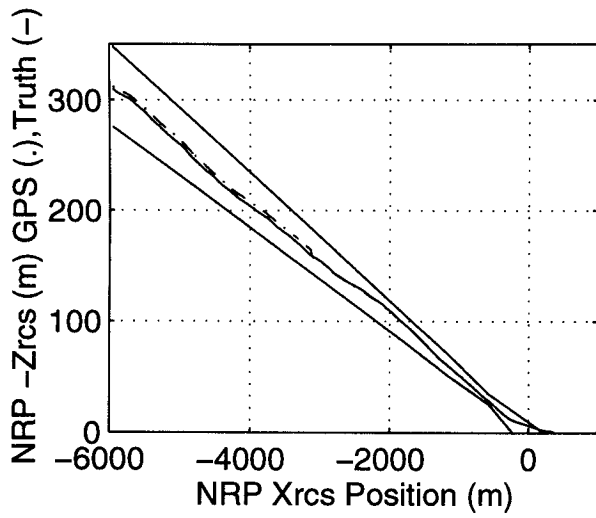
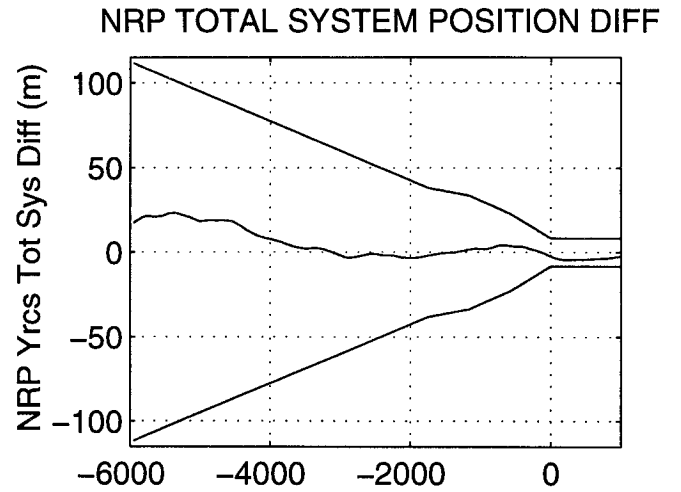
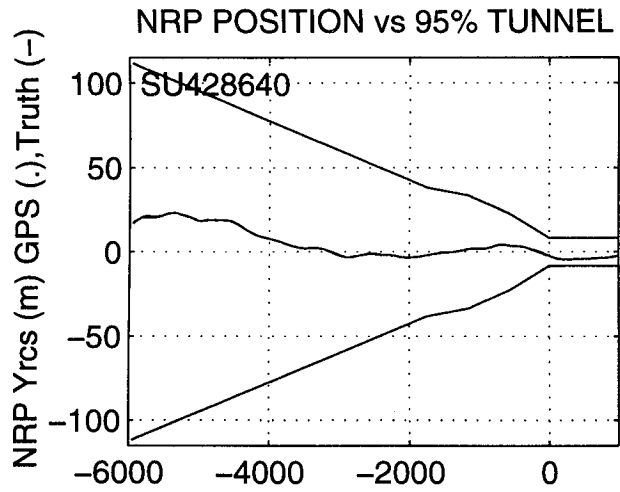
NRP Xrcs MEAN DIFFERENCE (m): 0.421
NRP Yrcs MEAN DIFFERENCE (m): -0.142
NRP Zrcs MEAN DIFFERENCE (m): 0.045

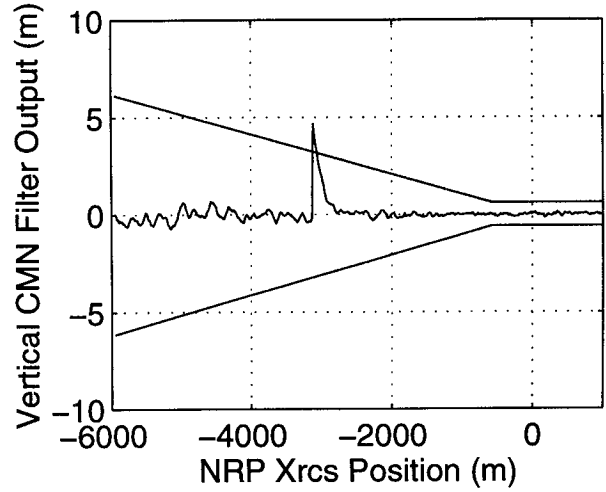
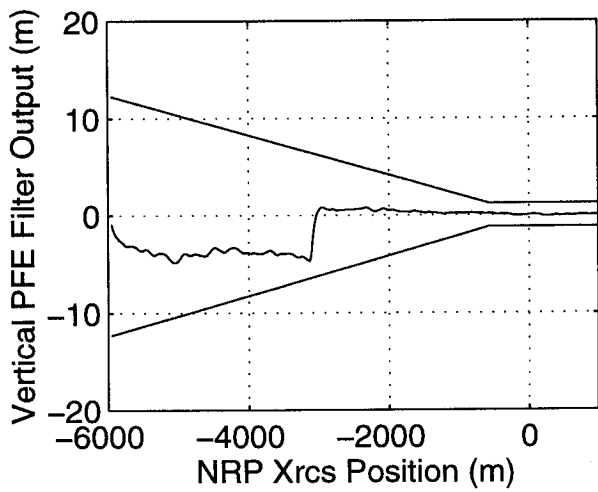
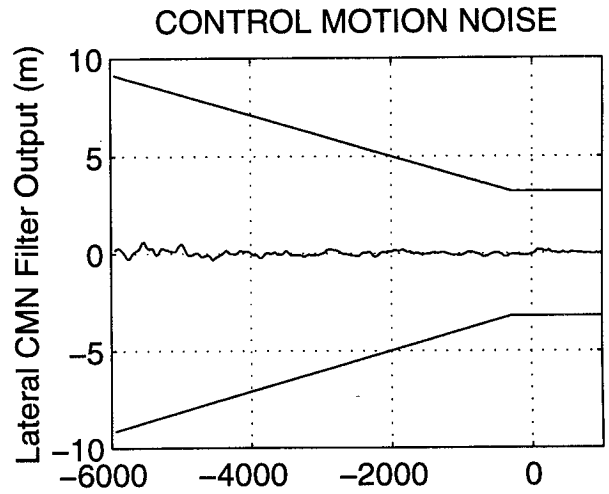
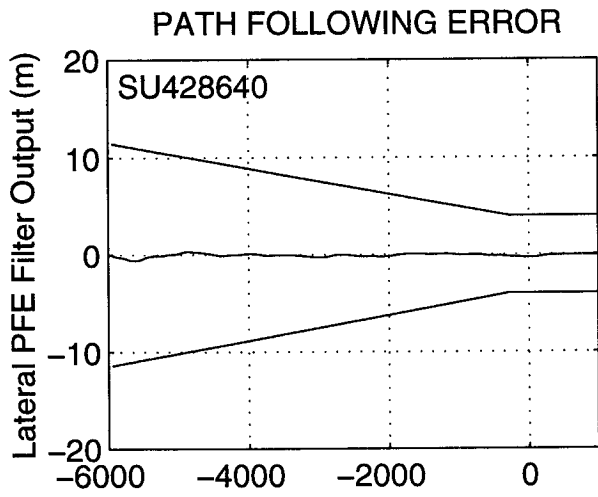
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.210
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.220
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.210

NRP Xrcs 2-RMS DIFFERENCE (m): 0.867
NRP Yrcs 2-RMS DIFFERENCE (m): 0.359
NRP Zrcs 2-RMS DIFFERENCE (m): 0.228

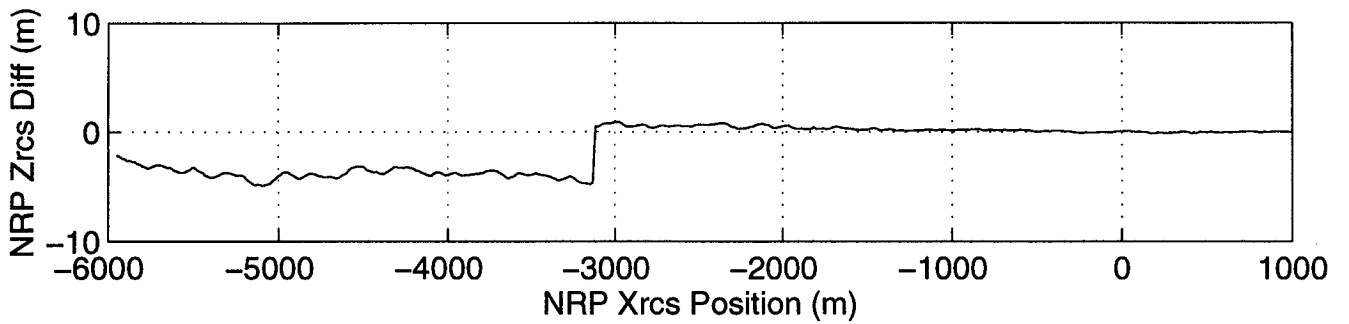
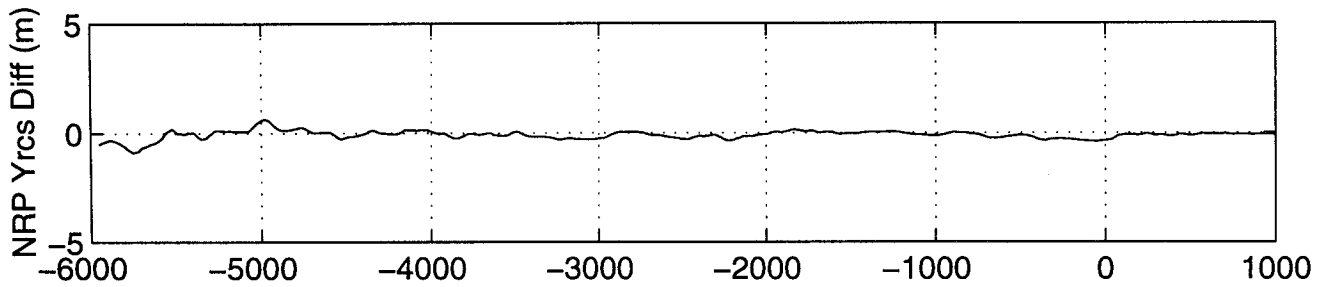
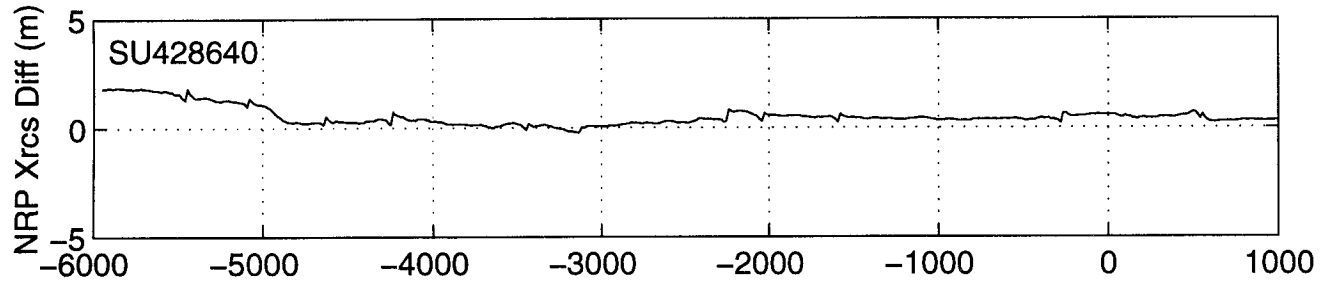
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 212.619
LGRP Yrcs POSITION (m): -3.203





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428642
START TIME: 416327.499
STOP TIME: 416447.249

MINIMUM HDOP: 3.9
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.4
MAXIMUM VDOP: 8.7
AVERAGE VDOP: 8.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.419
NRP Yrcs MEAN DIFFERENCE (m): -0.148
NRP Zrcs MEAN DIFFERENCE (m): 0.035

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.233
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.376
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.281

NRP Xrcs 2-RMS DIFFERENCE (m): 0.870
NRP Yrcs 2-RMS DIFFERENCE (m): 0.478
NRP Zrcs 2-RMS DIFFERENCE (m): 0.290

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 233.047
LGRP Yrcs POSITION (m): 1.531

APPROACH #: SU428642
START TIME: 416327.499
STOP TIME: 416447.249

MINIMUM HDOP: 3.9
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.9

MINIMUM VDOP: 8.4
MAXIMUM VDOP: 8.7
AVERAGE VDOP: 8.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

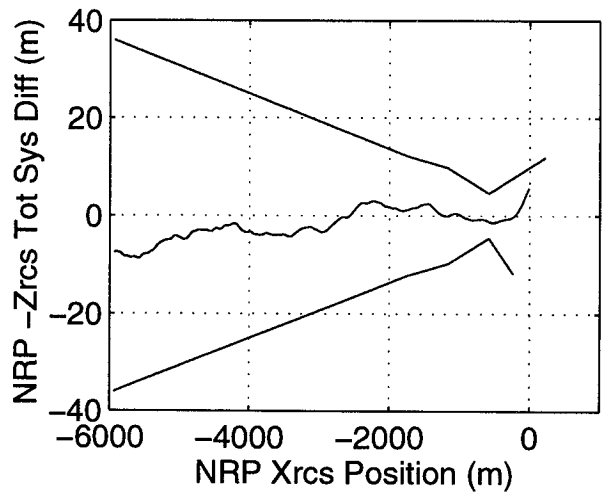
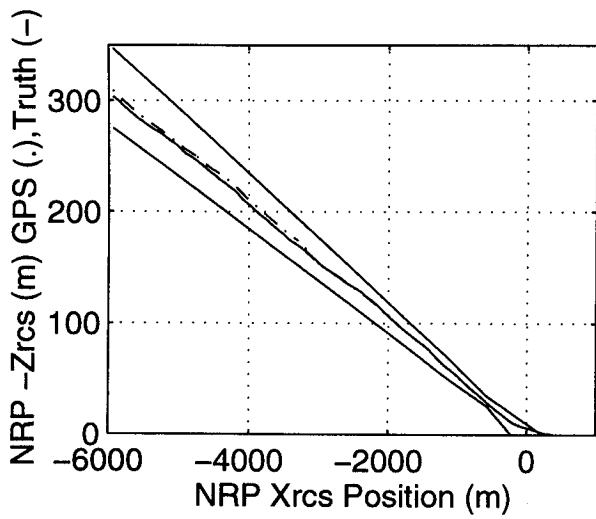
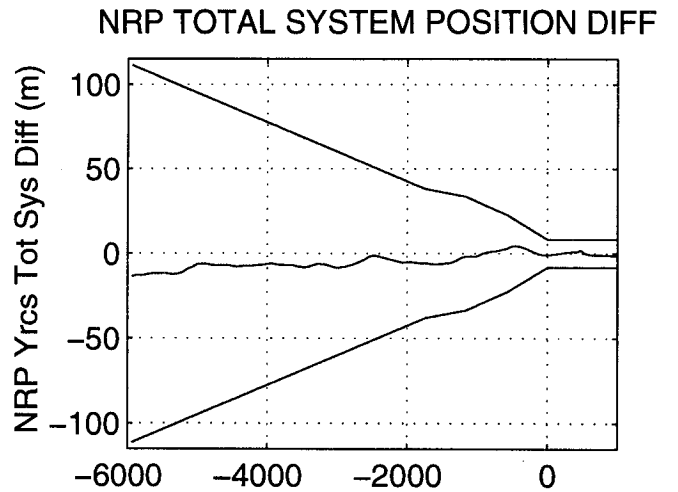
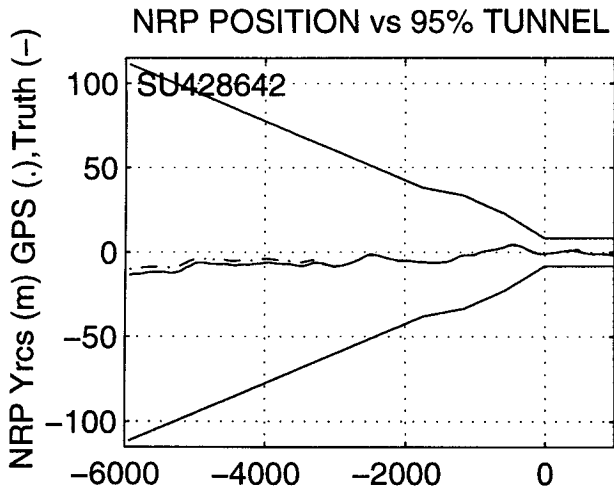
NRP Xrcs MEAN DIFFERENCE (m): 0.419
NRP Yrcs MEAN DIFFERENCE (m): -0.148
NRP Zrcs MEAN DIFFERENCE (m): 0.035

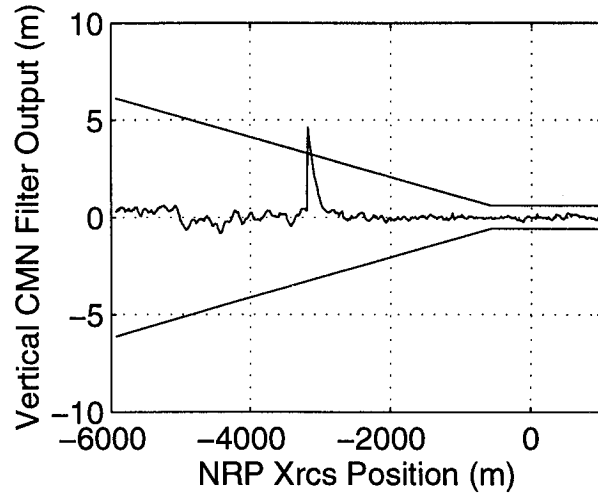
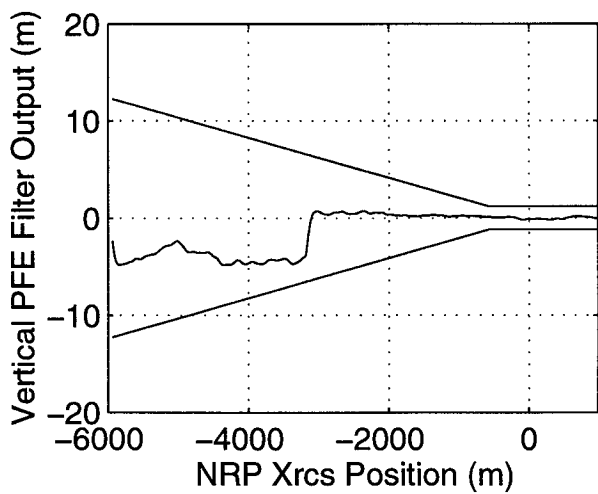
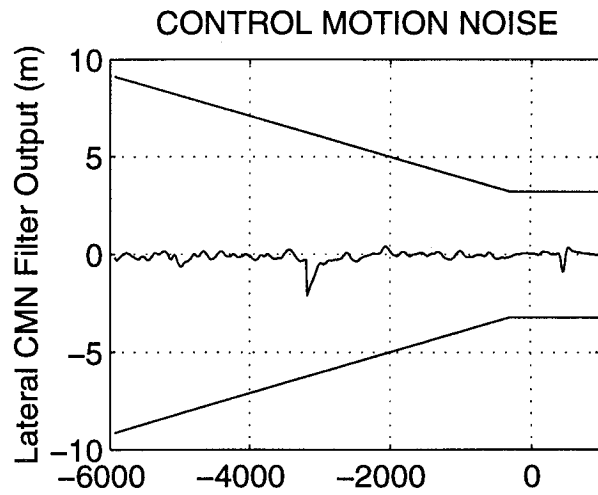
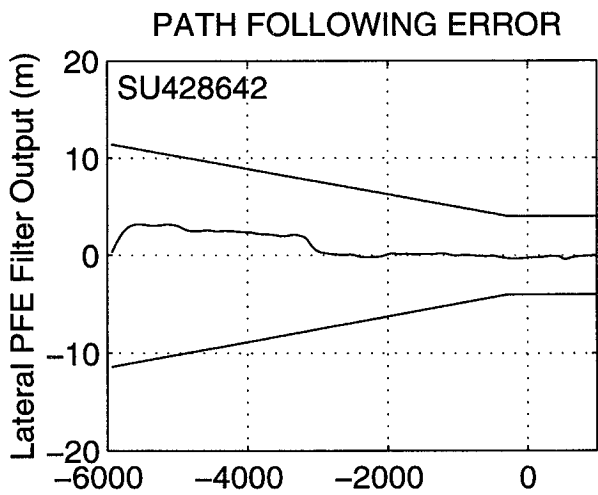
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.233
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.376
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.281

NRP Xrcs 2-RMS DIFFERENCE (m): 0.870
NRP Yrcs 2-RMS DIFFERENCE (m): 0.478
NRP Zrcs 2-RMS DIFFERENCE (m): 0.290

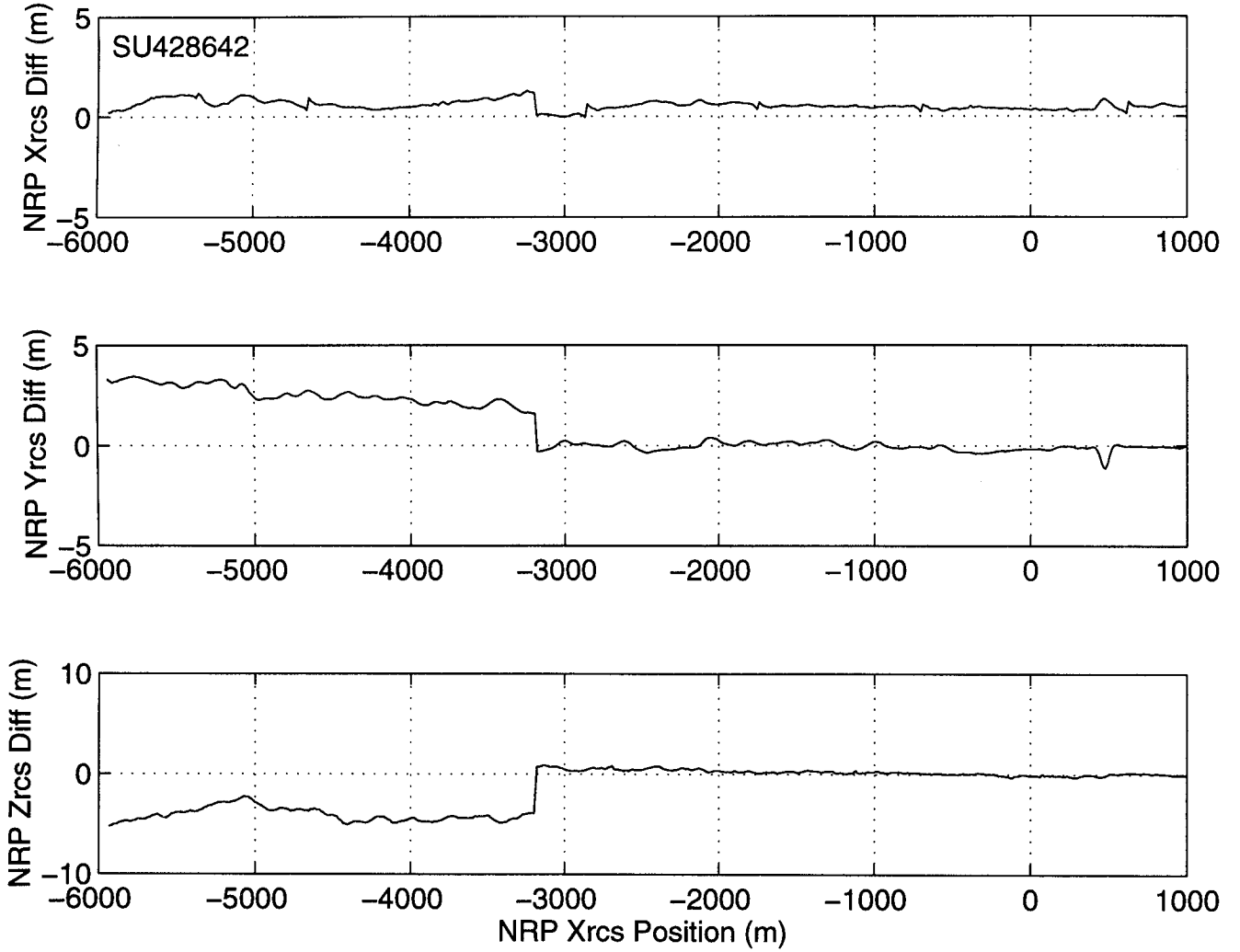
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 233.047
LGRP Yrcs POSITION (m): 1.531





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428644
START TIME: 416731.249
STOP TIME: 416847.749

MINIMUM HDOP: 4.1
MAXIMUM HDOP: 4.1
AVERAGE HDOP: 4.1

MINIMUM VDOP: 9.5
MAXIMUM VDOP: 9.8
AVERAGE VDOP: 9.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.392
NRP Yrcs MEAN DIFFERENCE (m): -0.082
NRP Zrcs MEAN DIFFERENCE (m): -0.061

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.240
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.257
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.275

NRP Xrcs 2-RMS DIFFERENCE (m): 0.819
NRP Yrcs 2-RMS DIFFERENCE (m): 0.304
NRP Zrcs 2-RMS DIFFERENCE (m): 0.301

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 165.709
LGRP Yrcs POSITION (m): 4.090

APPROACH #: SU428644
START TIME: 416731.249
STOP TIME: 416847.749

MINIMUM HDOP: 4.1
MAXIMUM HDOP: 4.1
AVERAGE HDOP: 4.1

MINIMUM VDOP: 9.5
MAXIMUM VDOP: 9.8
AVERAGE VDOP: 9.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

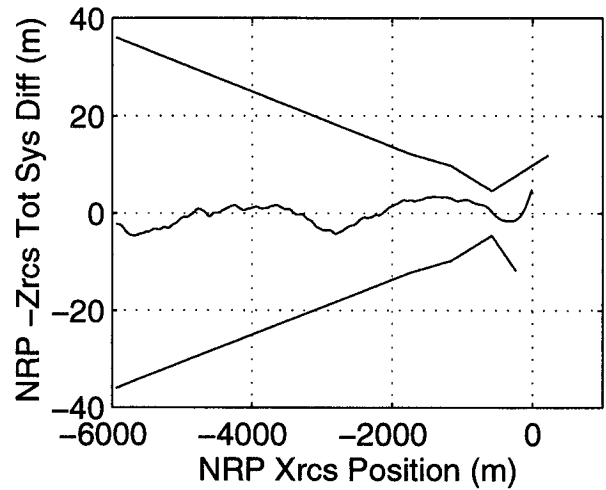
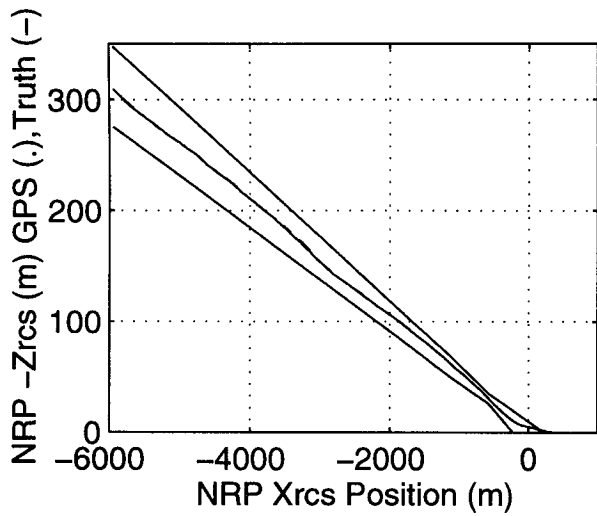
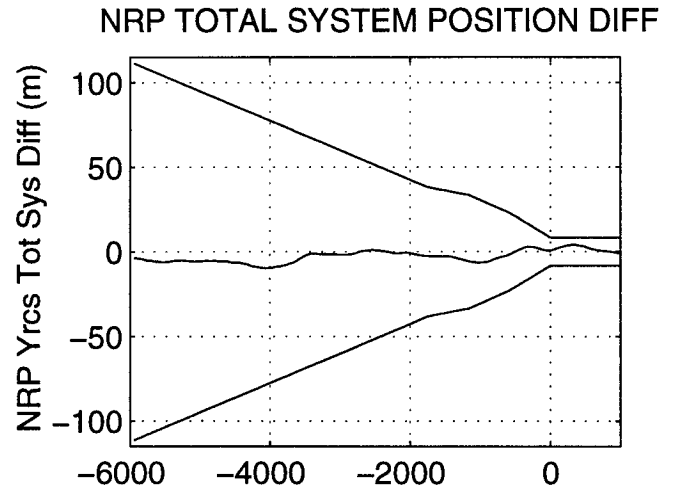
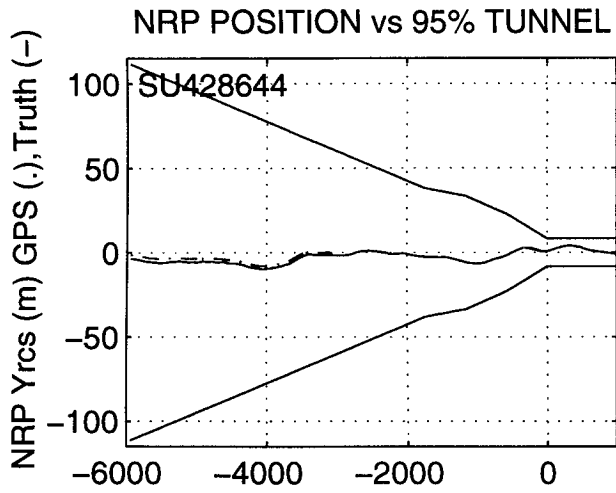
NRP Xrcs MEAN DIFFERENCE (m): 0.392
NRP Yrcs MEAN DIFFERENCE (m): -0.082
NRP Zrcs MEAN DIFFERENCE (m): -0.061

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.240
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.257
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.275

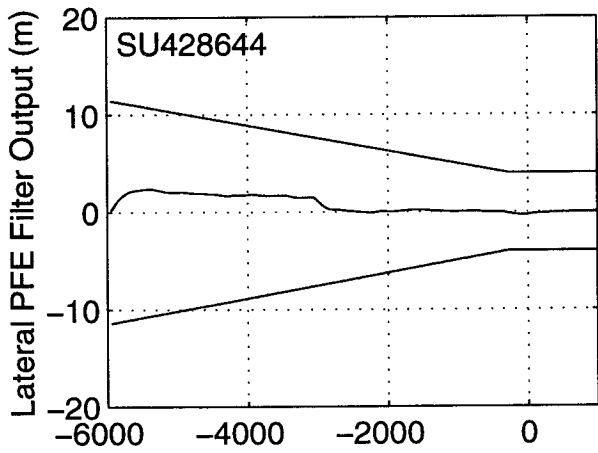
NRP Xrcs 2-RMS DIFFERENCE (m): 0.819
NRP Yrcs 2-RMS DIFFERENCE (m): 0.304
NRP Zrcs 2-RMS DIFFERENCE (m): 0.301

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

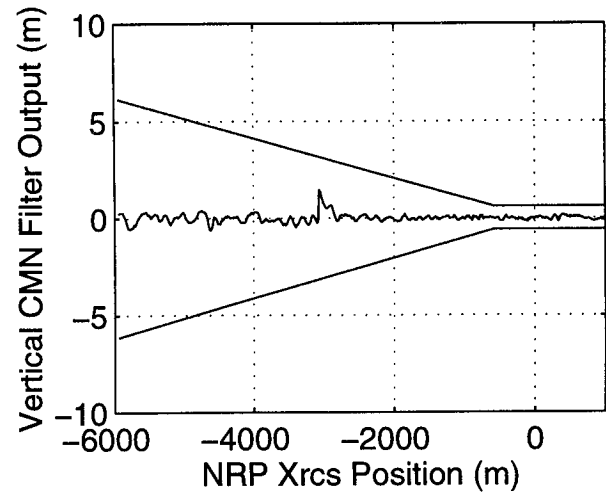
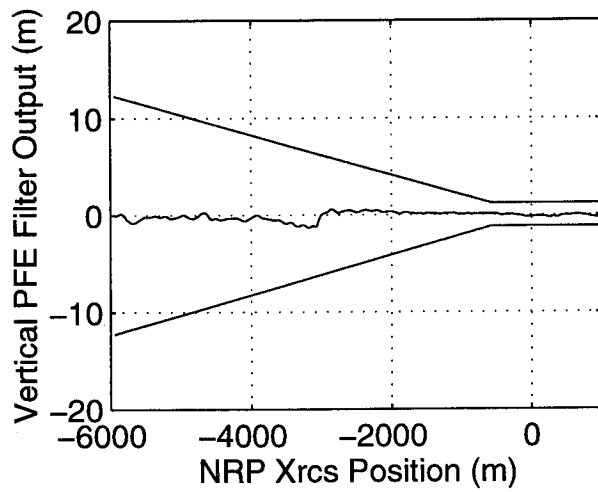
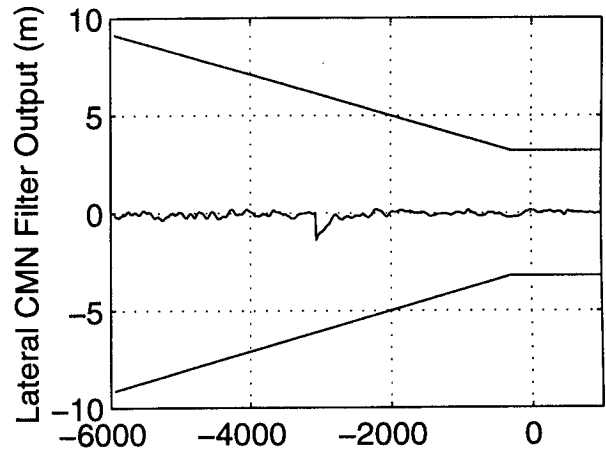
LGRP Xrcs POSITION (m): 165.709
LGRP Yrcs POSITION (m): 4.090



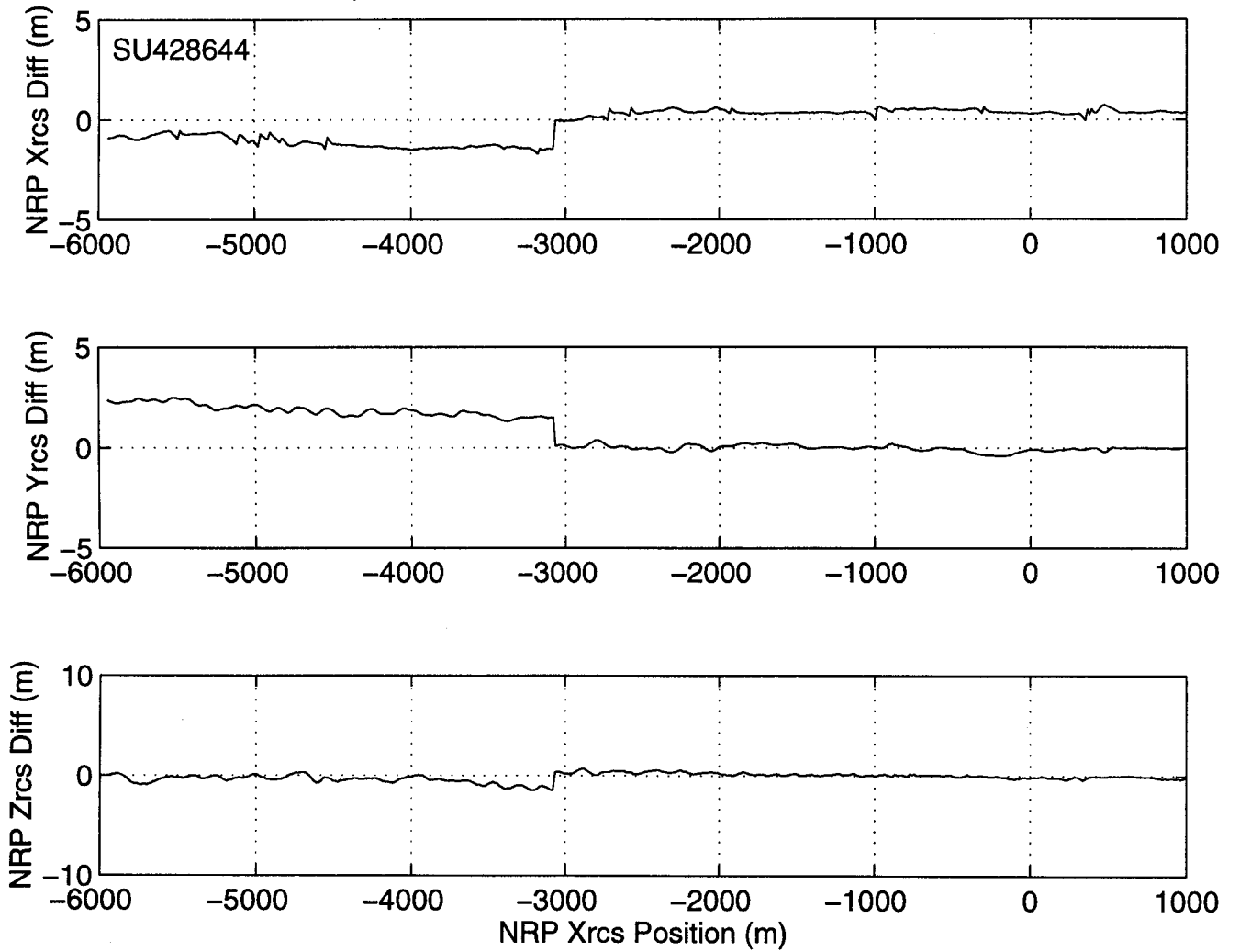
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428646
START TIME: 417130.499
STOP TIME: 417249.499

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 10.3
MAXIMUM VDOP: 10.4
AVERAGE VDOP: 10.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.534
NRP Yrcs MEAN DIFFERENCE (m): -0.190
NRP Zrcs MEAN DIFFERENCE (m): 0.001

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.265
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.405
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.218

NRP Xrcs 2-RMS DIFFERENCE (m): 1.100
NRP Yrcs 2-RMS DIFFERENCE (m): 0.556
NRP Zrcs 2-RMS DIFFERENCE (m): 0.218

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 392.889
LGRP Yrcs POSITION (m): 2.417

APPROACH #: SU428646
START TIME: 417130.499
STOP TIME: 417249.499

MINIMUM HDOP: 3.2
MAXIMUM HDOP: 3.2
AVERAGE HDOP: 3.2

MINIMUM VDOP: 10.3
MAXIMUM VDOP: 10.4
AVERAGE VDOP: 10.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

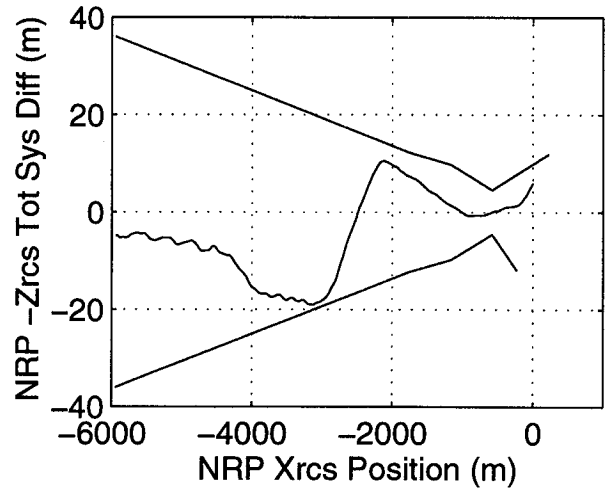
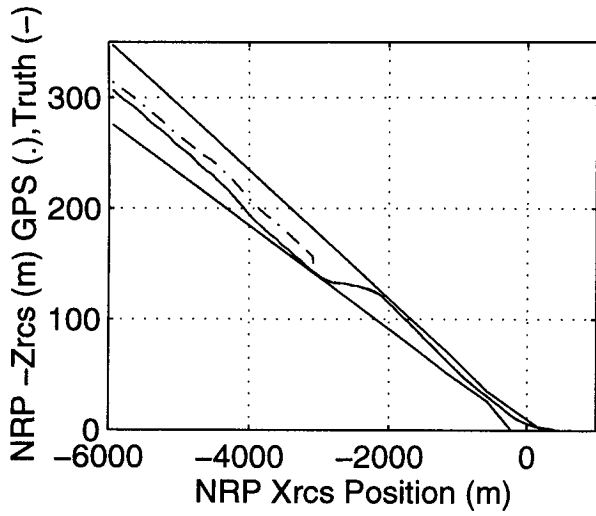
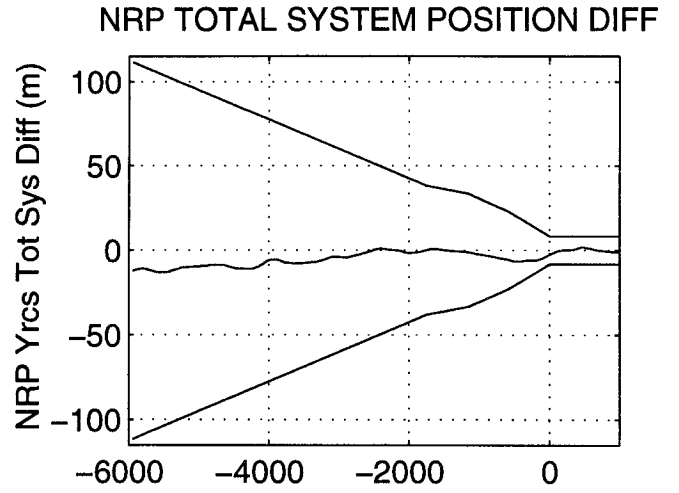
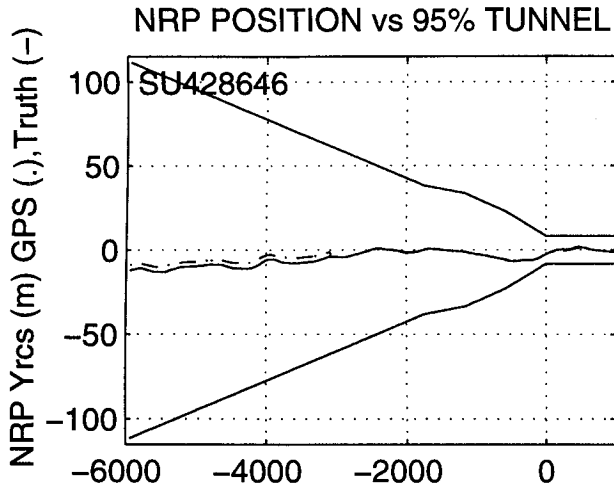
NRP Xrcs MEAN DIFFERENCE (m): 0.534
NRP Yrcs MEAN DIFFERENCE (m): -0.190
NRP Zrcs MEAN DIFFERENCE (m): 0.001

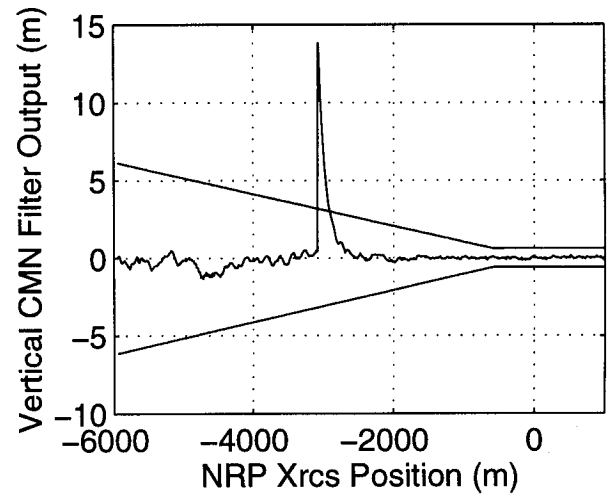
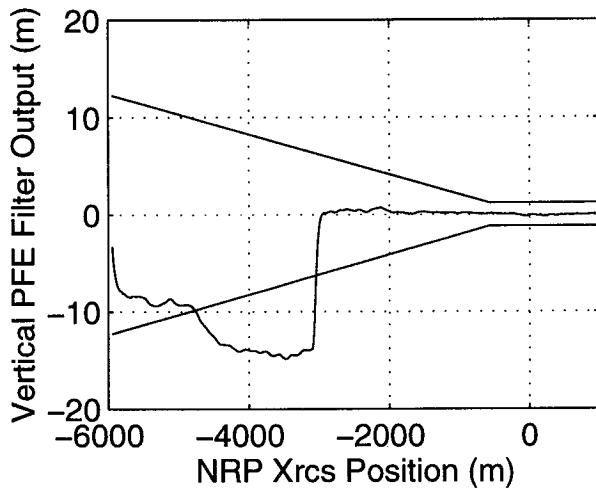
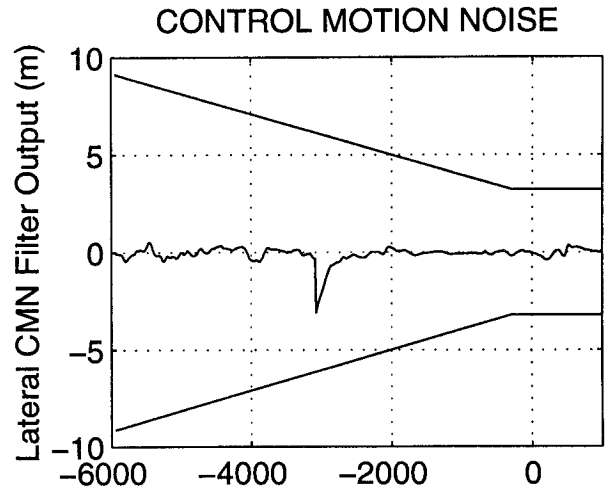
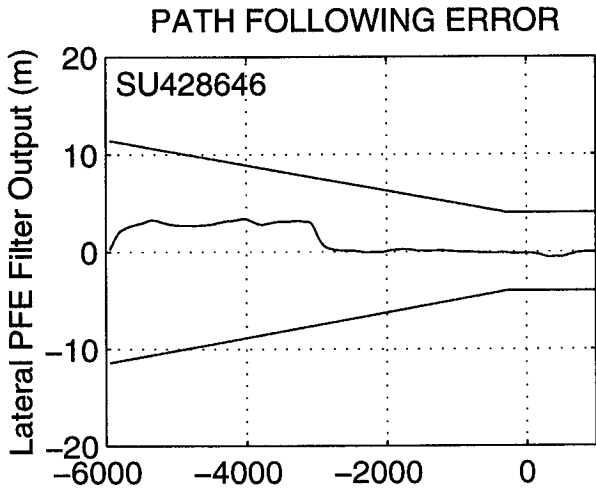
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.265
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.405
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.218

NRP Xrcs 2-RMS DIFFERENCE (m): 1.100
NRP Yrcs 2-RMS DIFFERENCE (m): 0.556
NRP Zrcs 2-RMS DIFFERENCE (m): 0.218

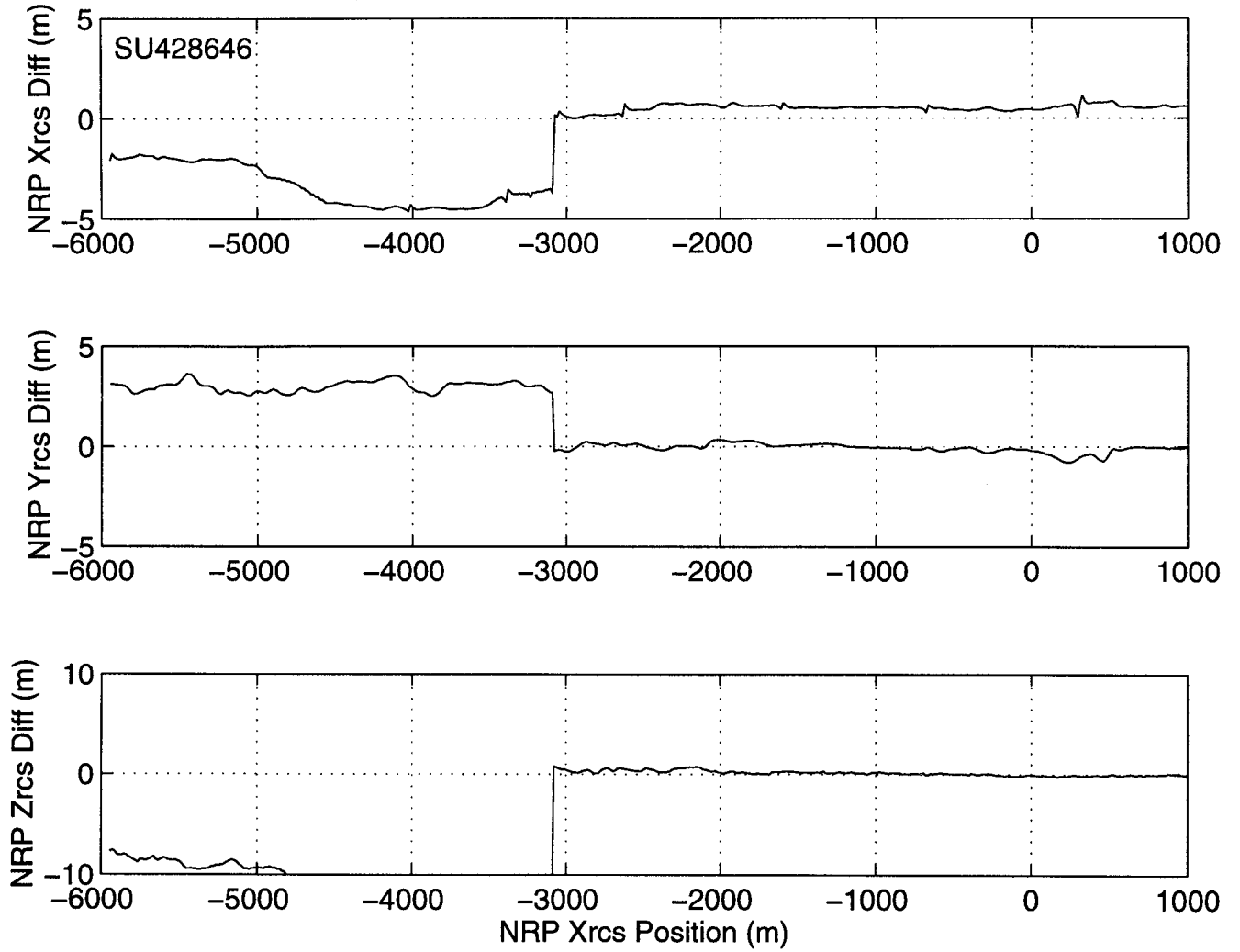
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 392.889
LGRP Yrcs POSITION (m): 2.417





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428648
START TIME: 417555.499
STOP TIME: 417670.499

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.0

MINIMUM VDOP: 10.1
MAXIMUM VDOP: 10.3
AVERAGE VDOP: 10.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.504
NRP Yrcs MEAN DIFFERENCE (m): -0.126
NRP Zrcs MEAN DIFFERENCE (m): 0.065

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.299
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.316
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.268

NRP Xrcs 2-RMS DIFFERENCE (m): 1.050
NRP Yrcs 2-RMS DIFFERENCE (m): 0.404
NRP Zrcs 2-RMS DIFFERENCE (m): 0.298

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 161.042
LGRP Yrcs POSITION (m): 3.234

APPROACH #: SU428648
START TIME: 417555.499
STOP TIME: 417670.499

MINIMUM HDOP: 3.0
MAXIMUM HDOP: 3.1
AVERAGE HDOP: 3.0

MINIMUM VDOP: 10.1
MAXIMUM VDOP: 10.3
AVERAGE VDOP: 10.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

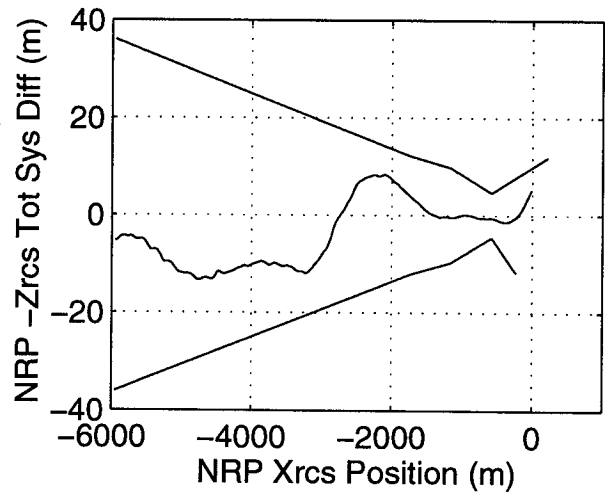
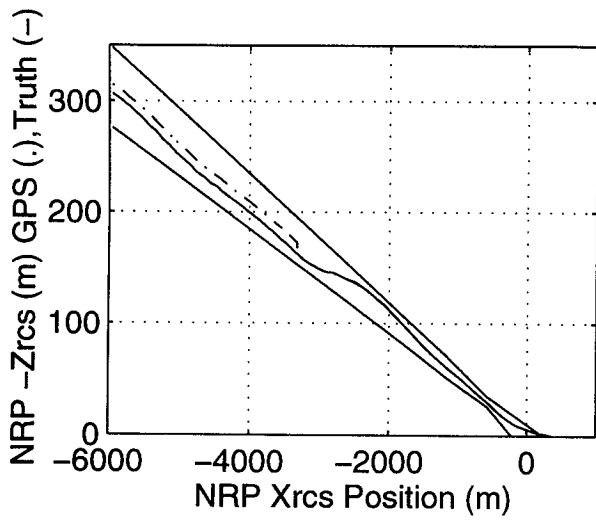
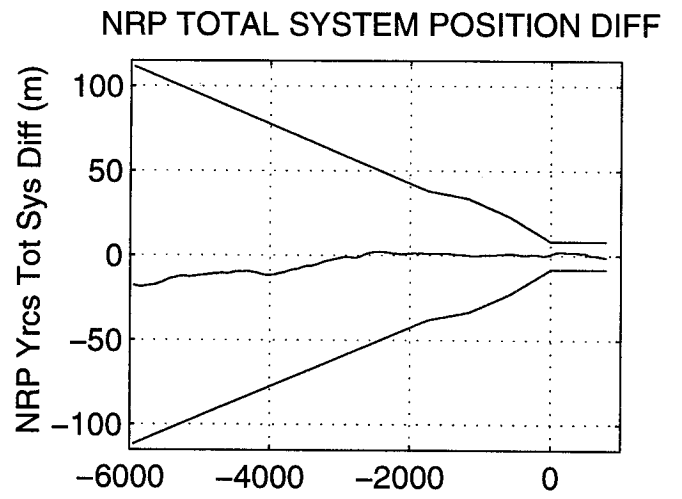
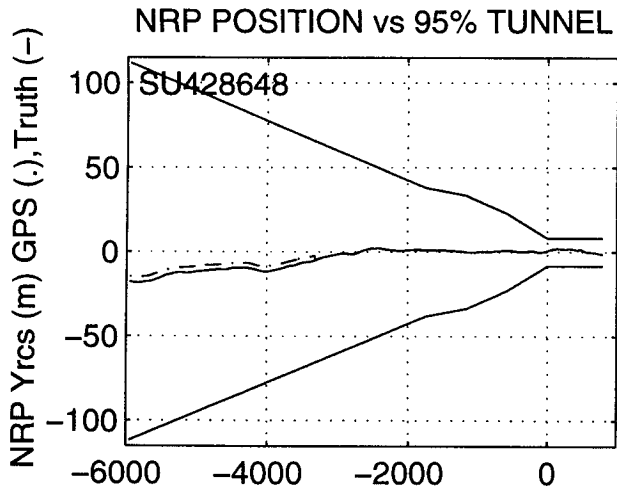
NRP Xrcs MEAN DIFFERENCE (m): 0.504
NRP Yrcs MEAN DIFFERENCE (m): -0.126
NRP Zrcs MEAN DIFFERENCE (m): 0.065

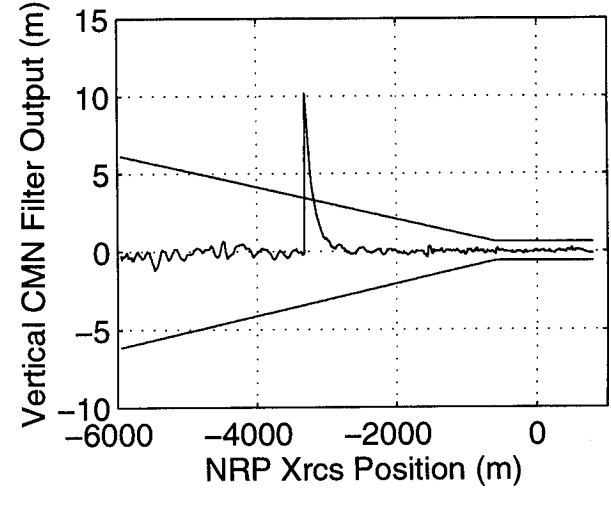
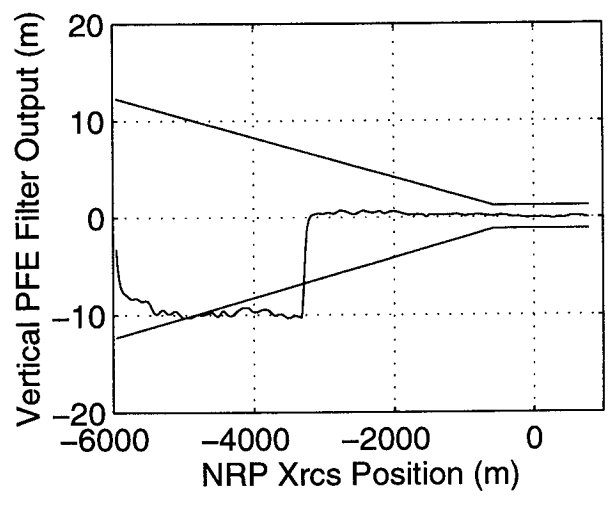
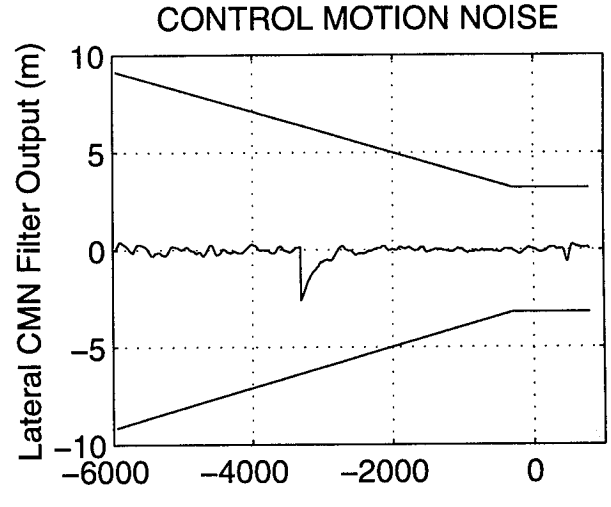
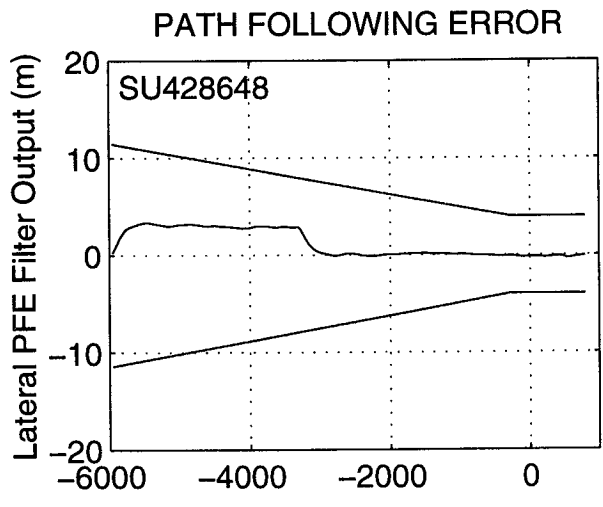
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.299
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.316
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.268

NRP Xrcs 2-RMS DIFFERENCE (m): 1.050
NRP Yrcs 2-RMS DIFFERENCE (m): 0.404
NRP Zrcs 2-RMS DIFFERENCE (m): 0.298

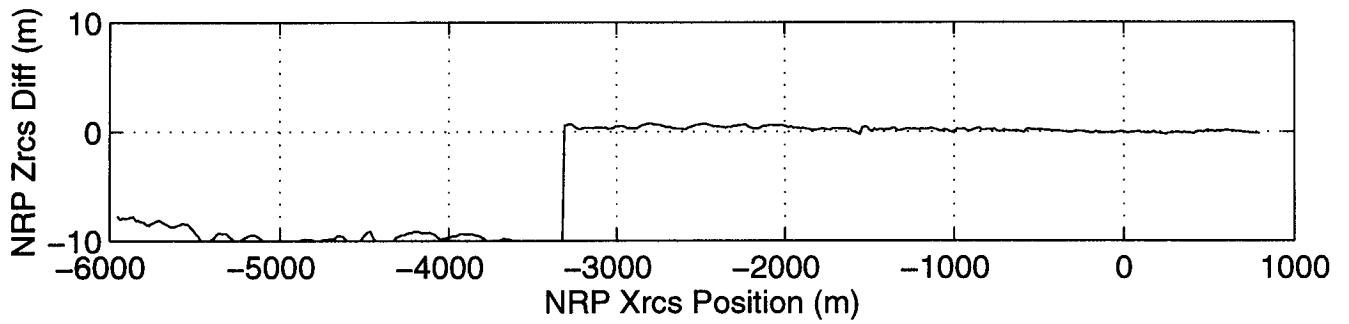
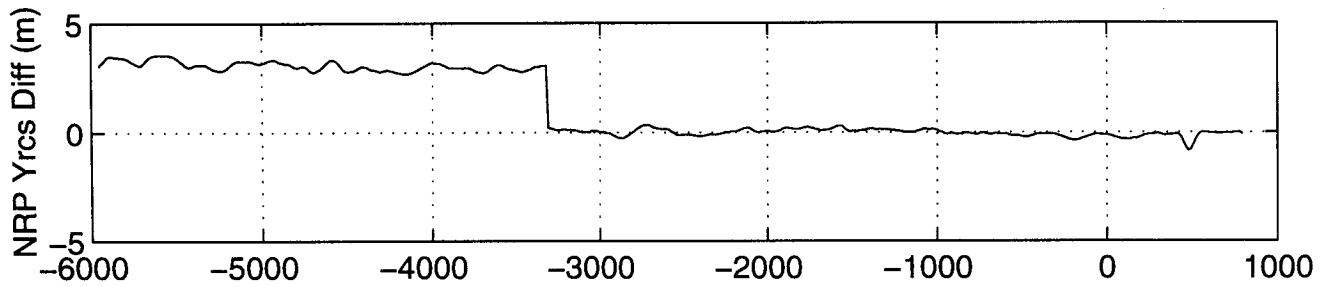
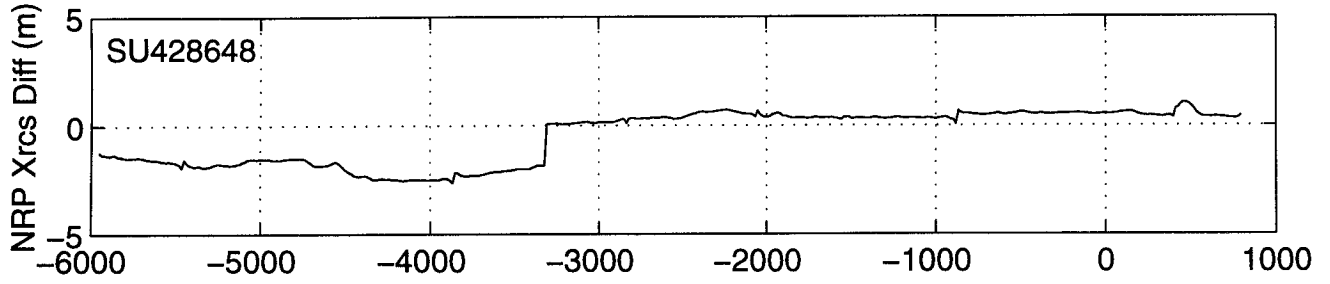
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 161.042
LGRP Yrcs POSITION (m): 3.234





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428650
START TIME: 417993.499
STOP TIME: 418113.999

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 9.2
MAXIMUM VDOP: 9.5
AVERAGE VDOP: 9.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.500
NRP Yrcs MEAN DIFFERENCE (m): -0.156
NRP Zrcs MEAN DIFFERENCE (m): 0.059

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.325
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.508
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.253

NRP Xrcs 2-RMS DIFFERENCE (m): 1.052
NRP Yrcs 2-RMS DIFFERENCE (m): 0.596
NRP Zrcs 2-RMS DIFFERENCE (m): 0.279

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 96.989
LGRP Yrcs POSITION (m): 5.739

APPROACH #: SU428650
START TIME: 417993.499
STOP TIME: 418113.999

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 9.2
MAXIMUM VDOP: 9.5
AVERAGE VDOP: 9.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

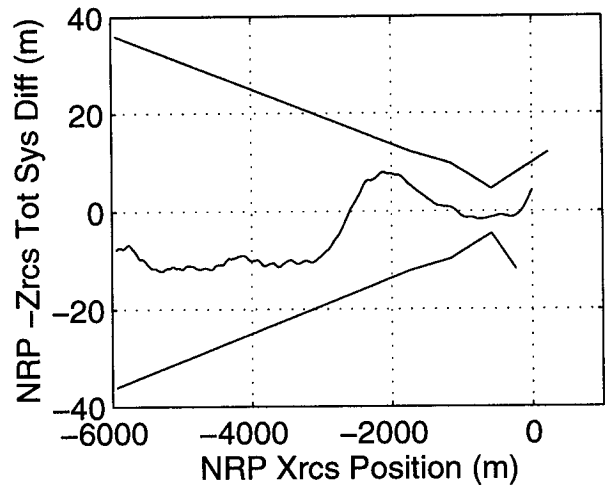
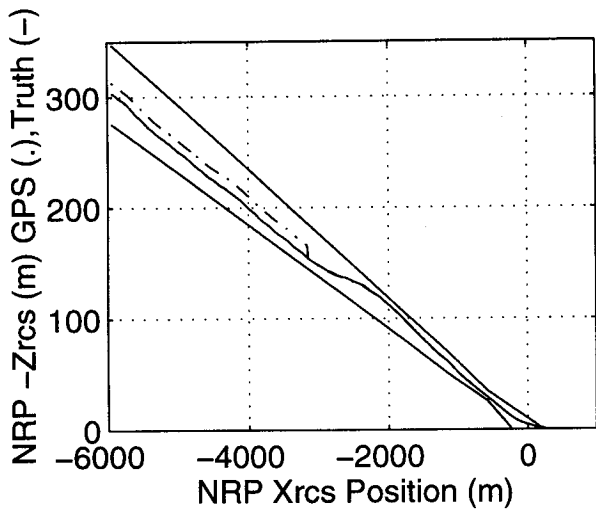
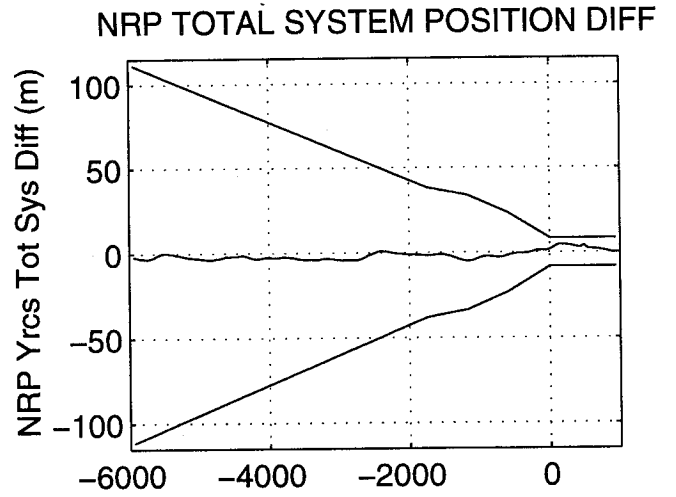
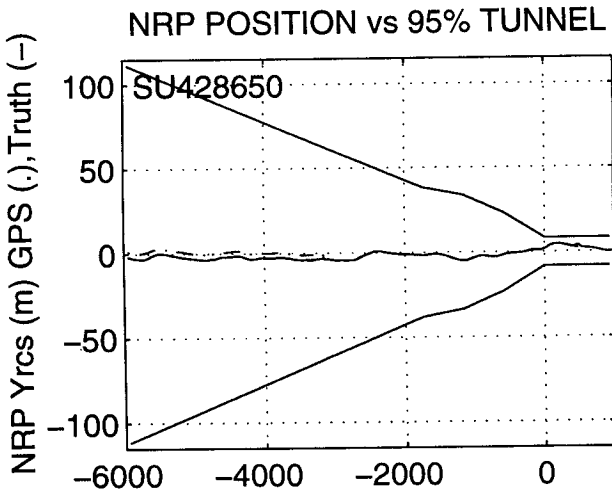
NRP Xrcs MEAN DIFFERENCE (m): 0.500
NRP Yrcs MEAN DIFFERENCE (m): -0.156
NRP Zrcs MEAN DIFFERENCE (m): 0.059

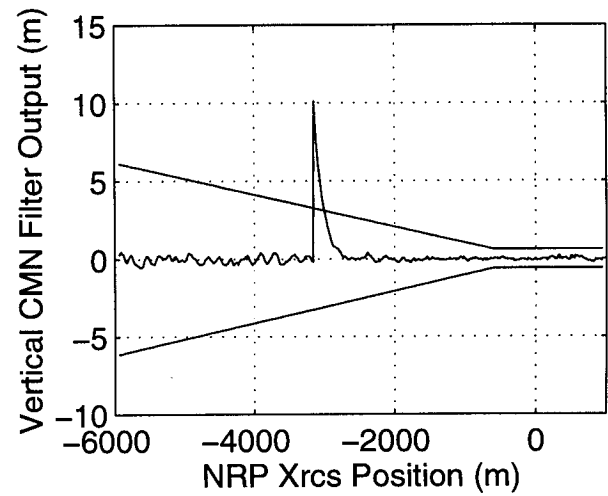
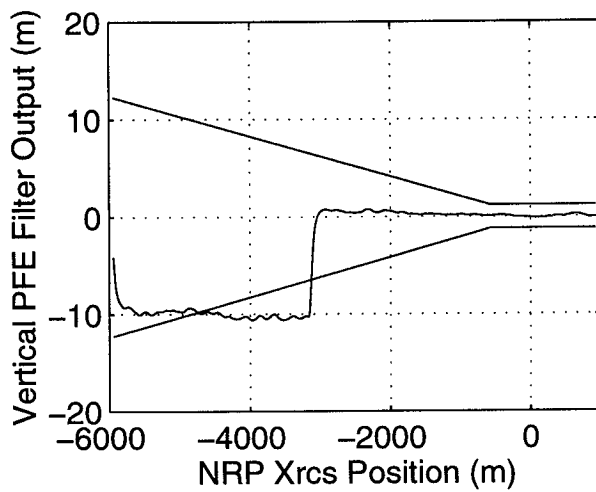
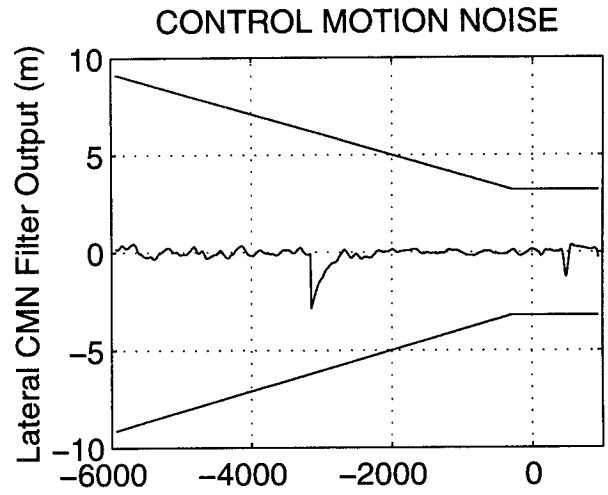
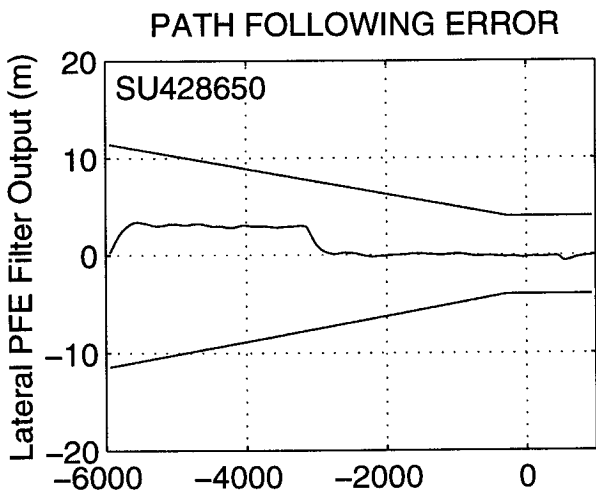
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.325
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.508
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.253

NRP Xrcs 2-RMS DIFFERENCE (m): 1.052
NRP Yrcs 2-RMS DIFFERENCE (m): 0.596
NRP Zrcs 2-RMS DIFFERENCE (m): 0.279

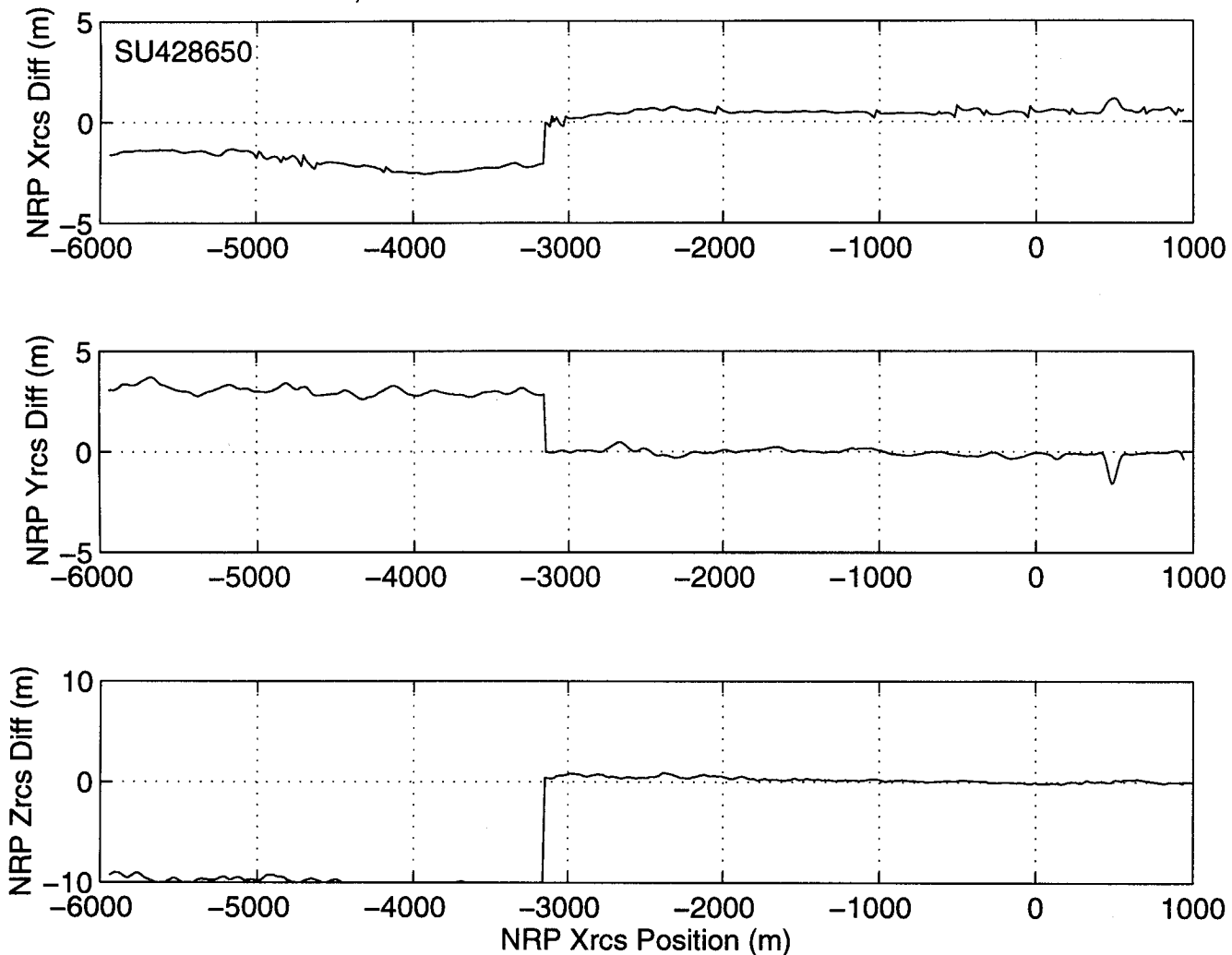
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 96.989
LGRP Yrcs POSITION (m): 5.739





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428652
START TIME: 418396.249
STOP TIME: 418517.749

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.6
AVERAGE HDOP: 2.6

MINIMUM VDOP: 8.0
MAXIMUM VDOP: 8.4
AVERAGE VDOP: 8.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.557
NRP Yrcs MEAN DIFFERENCE (m): -0.181
NRP Zrcs MEAN DIFFERENCE (m): 0.083

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.209
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.258
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.197

NRP Xrcs 2-RMS DIFFERENCE (m): 1.134
NRP Yrcs 2-RMS DIFFERENCE (m): 0.445
NRP Zrcs 2-RMS DIFFERENCE (m): 0.258

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 218.954
LGRP Yrcs POSITION (m): -1.106

APPROACH #: SU428652
START TIME: 418396.249
STOP TIME: 418517.749

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.6
AVERAGE HDOP: 2.6

MINIMUM VDOP: 8.0
MAXIMUM VDOP: 8.4
AVERAGE VDOP: 8.2

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

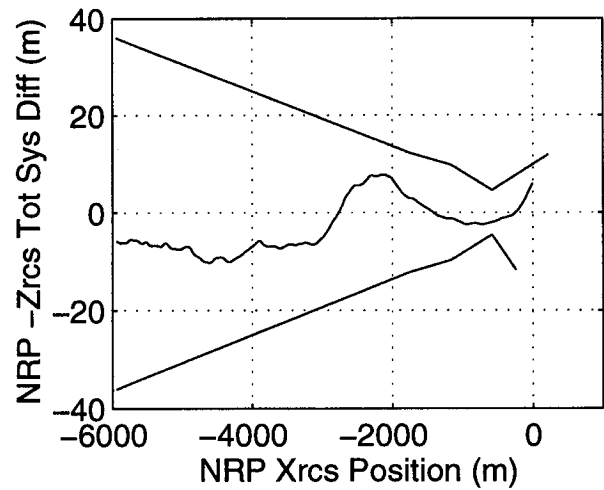
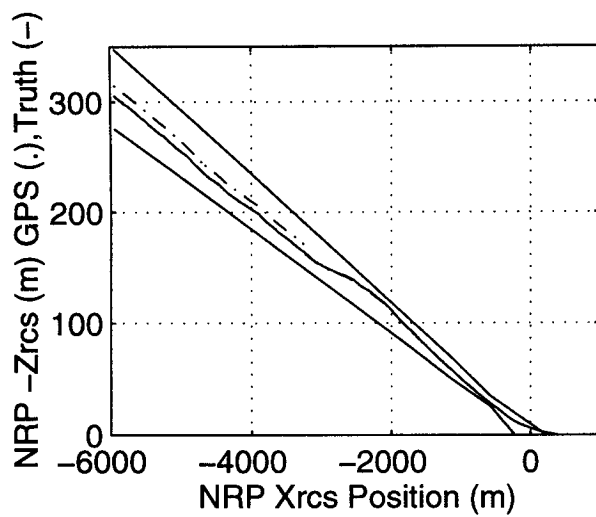
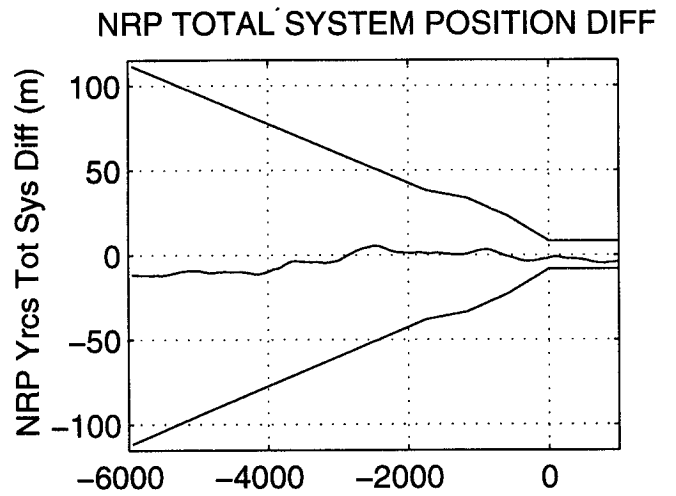
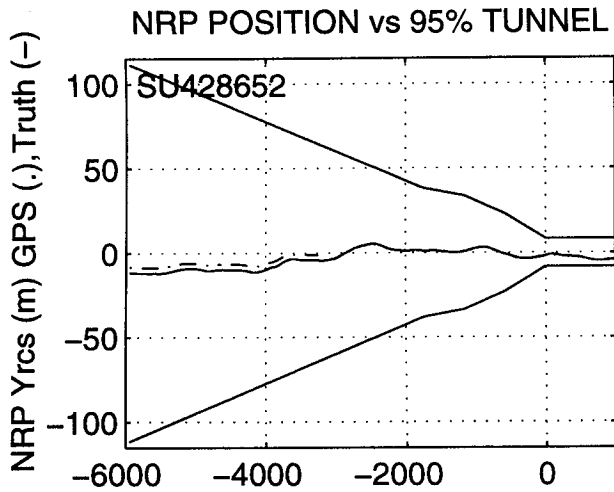
NRP Xrcs MEAN DIFFERENCE (m): 0.557
NRP Yrcs MEAN DIFFERENCE (m): -0.181
NRP Zrcs MEAN DIFFERENCE (m): 0.083

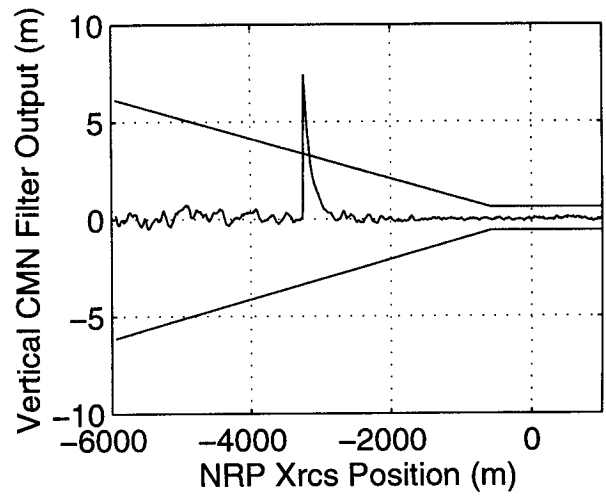
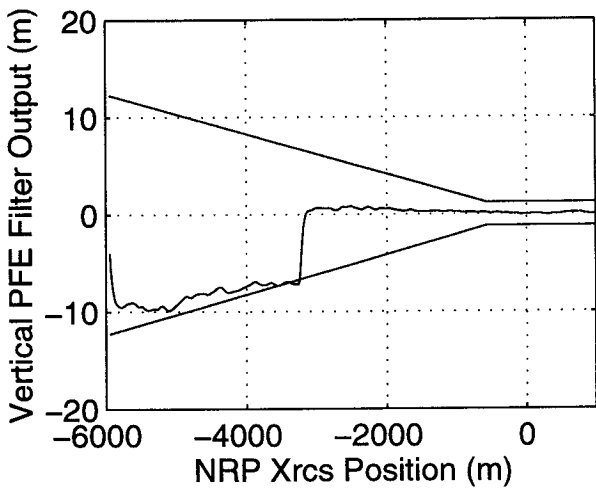
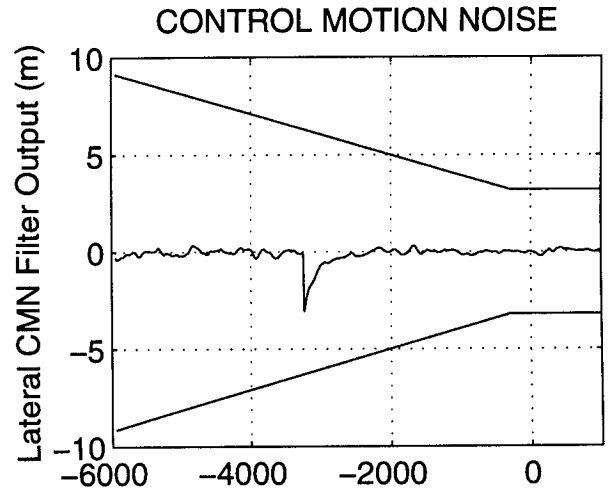
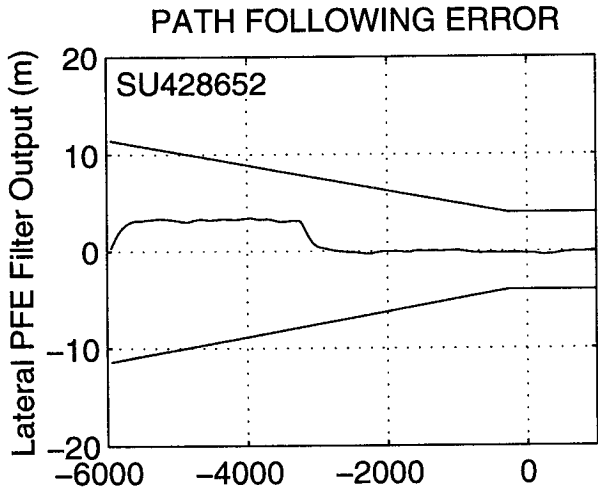
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.209
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.258
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.197

NRP Xrcs 2-RMS DIFFERENCE (m): 1.134
NRP Yrcs 2-RMS DIFFERENCE (m): 0.445
NRP Zrcs 2-RMS DIFFERENCE (m): 0.258

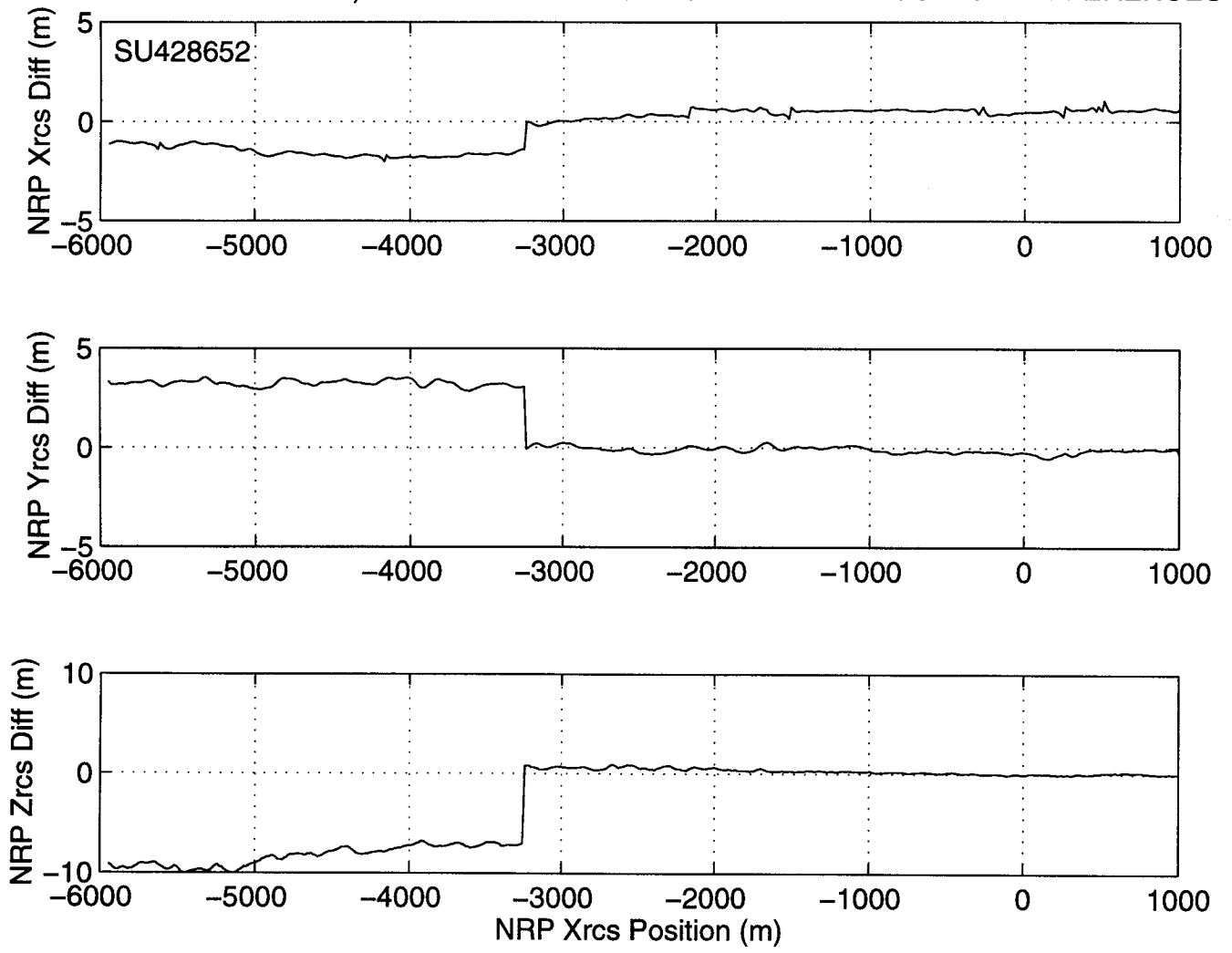
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

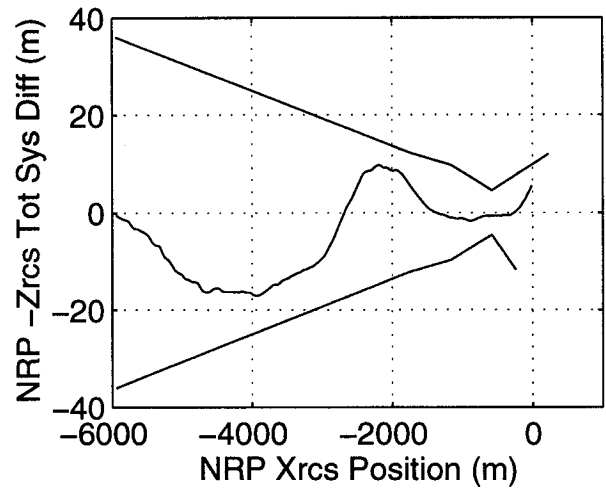
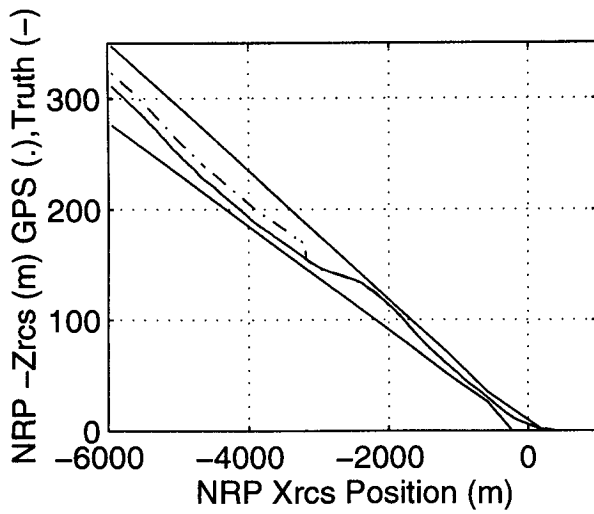
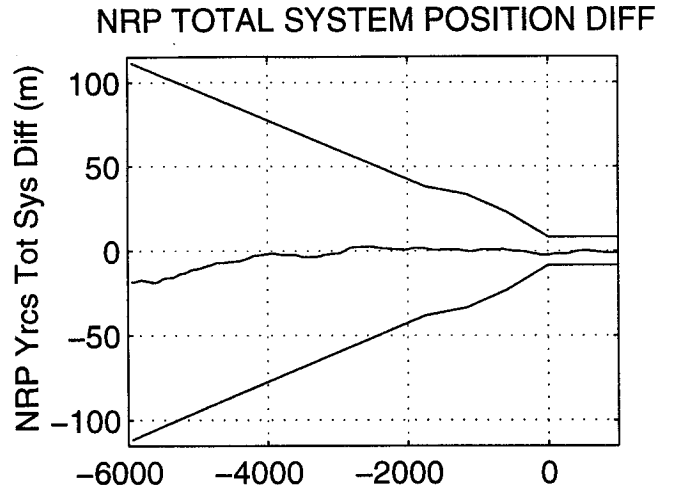
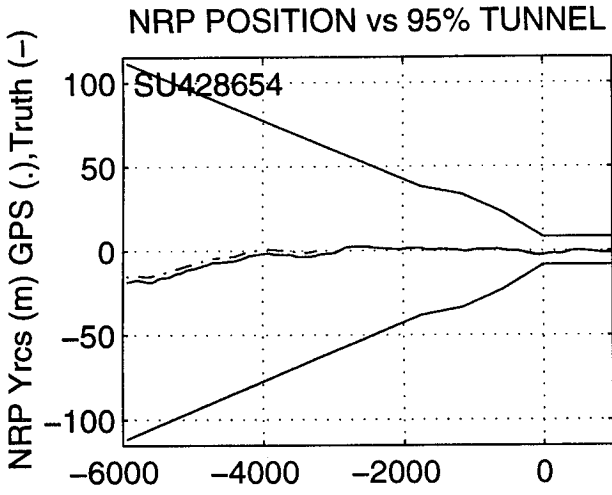
LGRP Xrcs POSITION (m): 218.954
LGRP Yrcs POSITION (m): -1.106

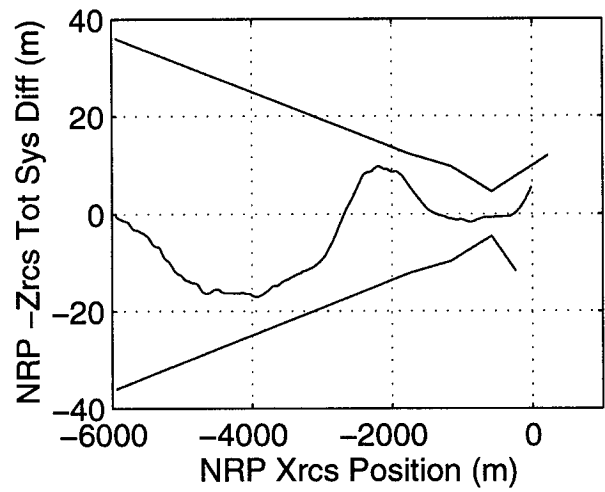
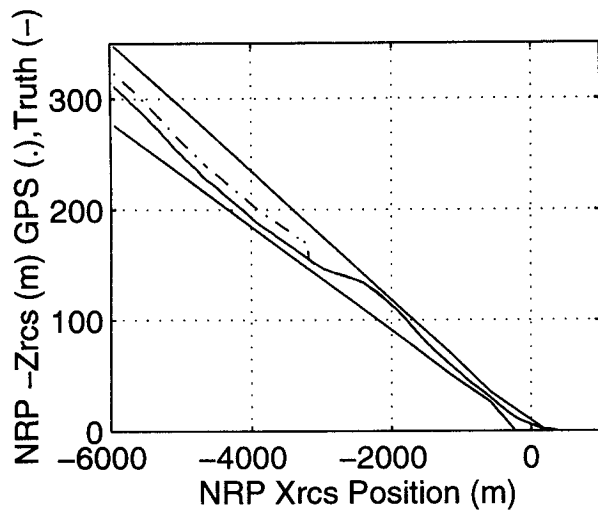
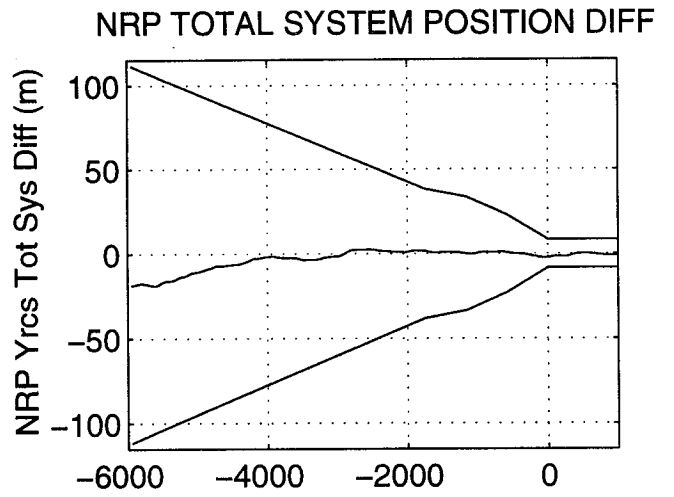
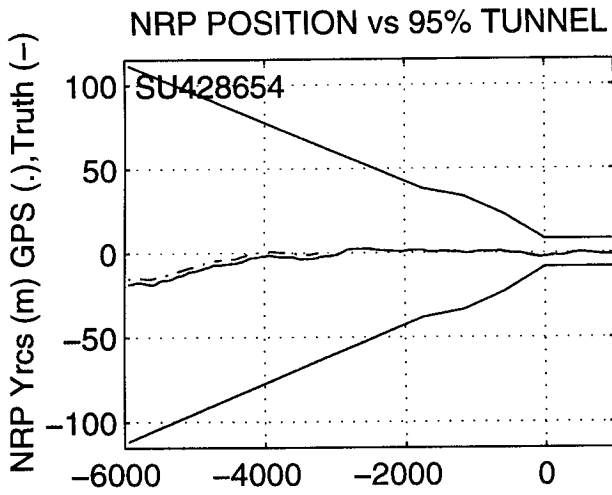


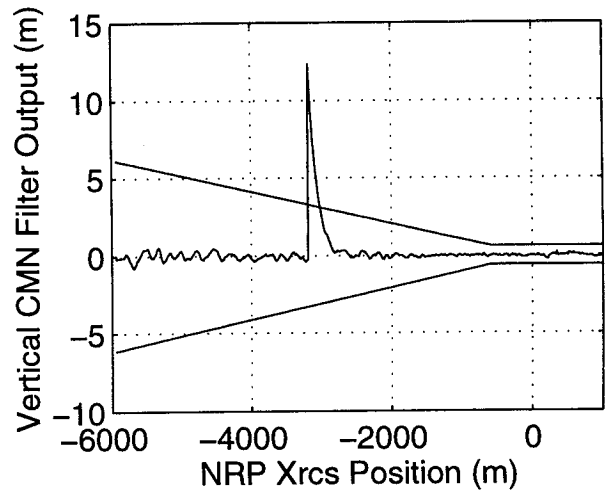
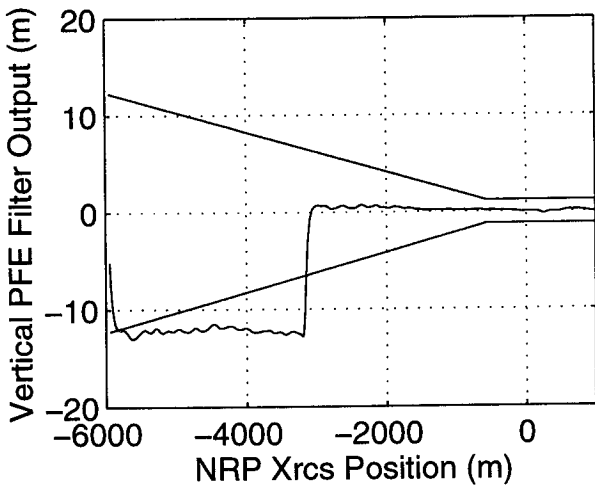
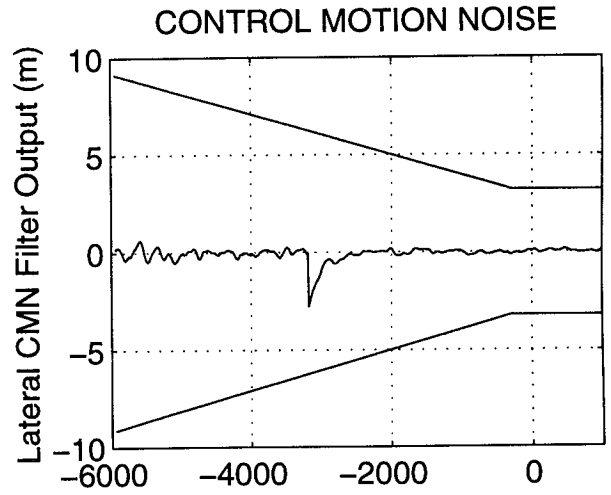
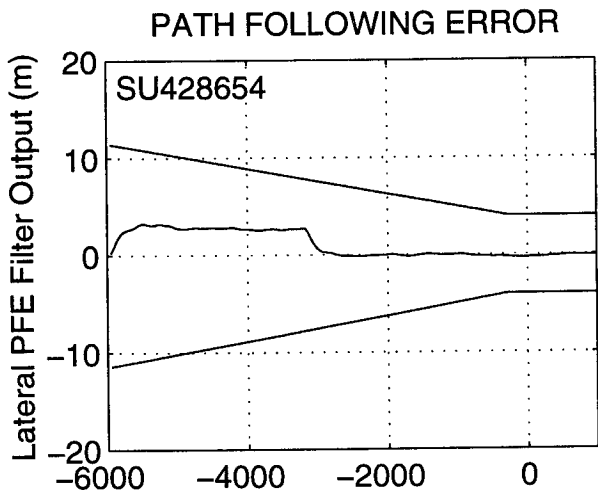


NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES

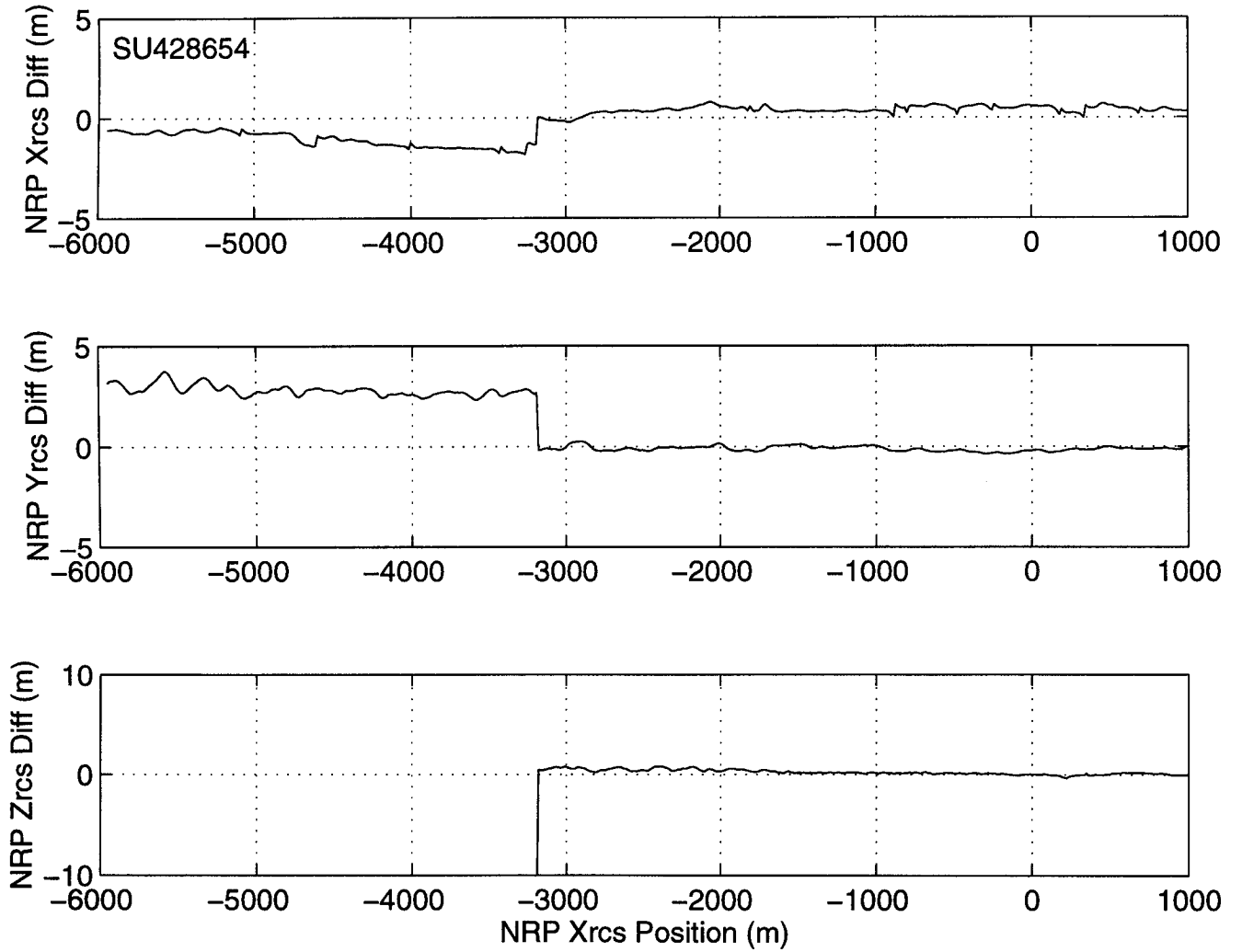








NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428656
START TIME: 419222.499
STOP TIME: 419338.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 6.1
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.383
NRP Yrcs MEAN DIFFERENCE (m): -0.124
NRP Zrcs MEAN DIFFERENCE (m): 0.060

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.264
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.168
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.291

NRP Xrcs 2-RMS DIFFERENCE (m): 0.811
NRP Yrcs 2-RMS DIFFERENCE (m): 0.300
NRP Zrcs 2-RMS DIFFERENCE (m): 0.315

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 163.272
LGRP Yrcs POSITION (m): -0.365

APPROACH #: SU428656
START TIME: 419222.499
STOP TIME: 419338.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 5.8
MAXIMUM VDOP: 6.1
AVERAGE VDOP: 6.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

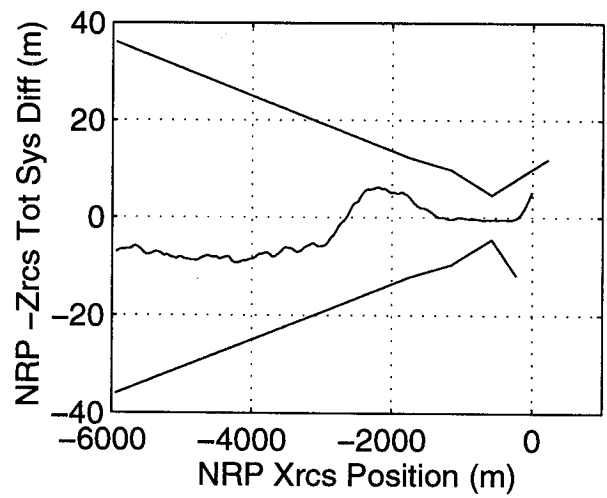
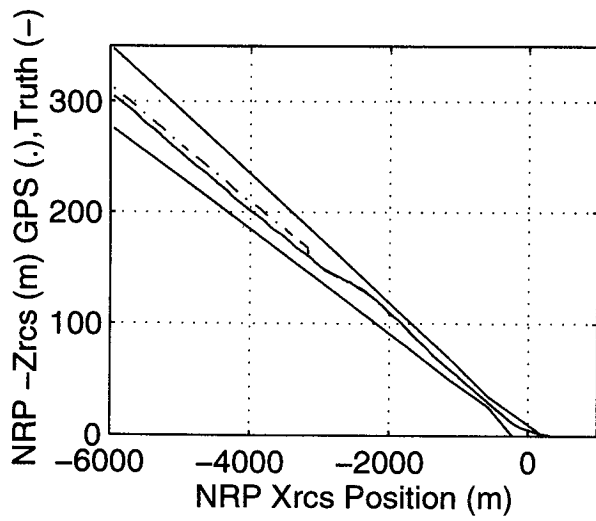
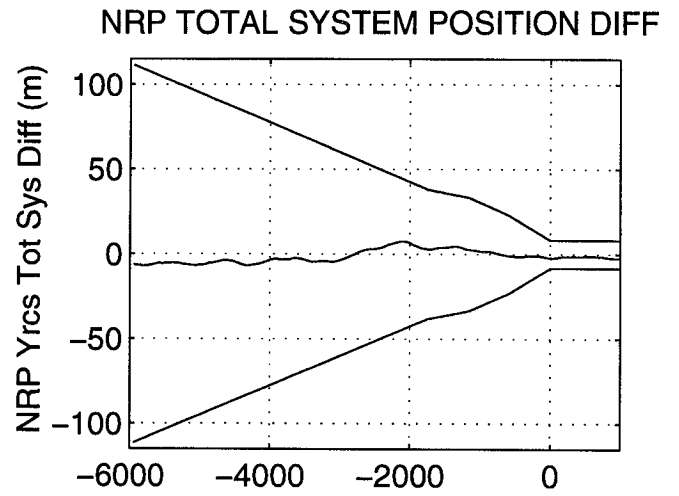
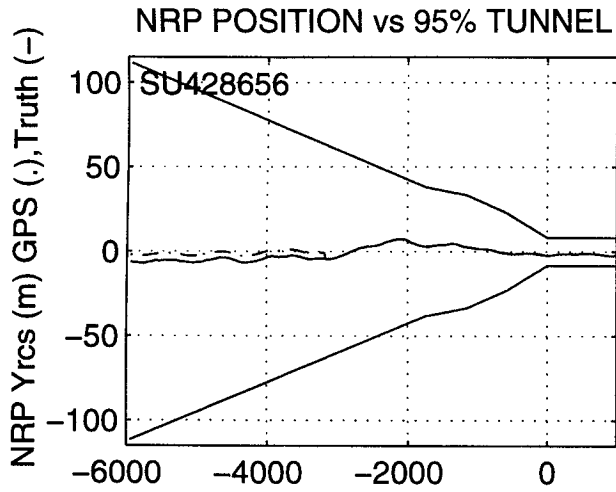
NRP Xrcs MEAN DIFFERENCE (m): 0.383
NRP Yrcs MEAN DIFFERENCE (m): -0.124
NRP Zrcs MEAN DIFFERENCE (m): 0.060

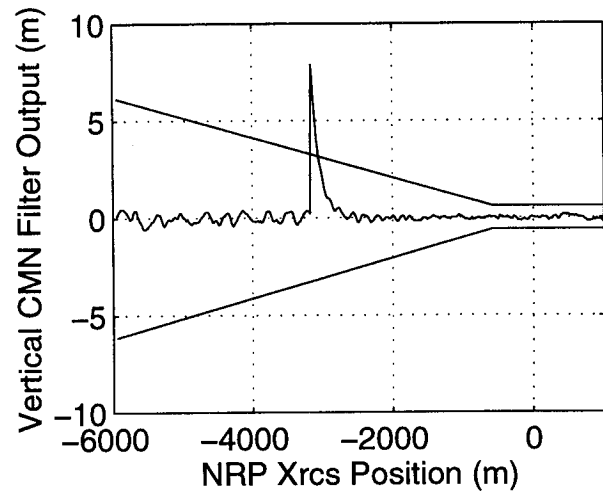
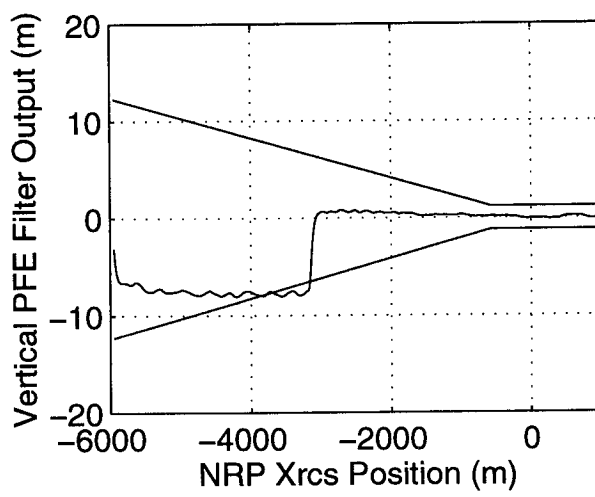
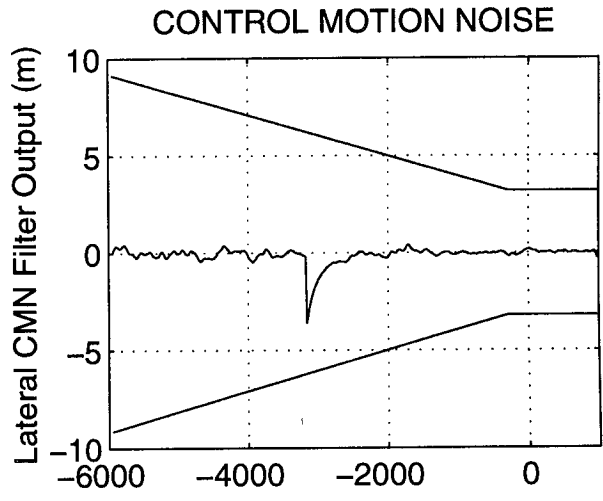
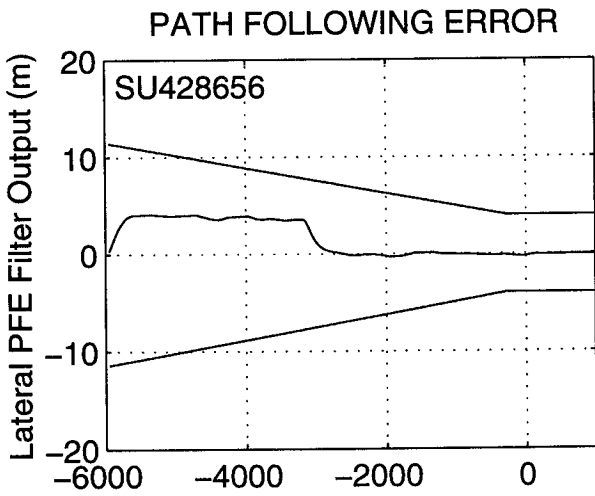
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.264
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.168
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.291

NRP Xrcs 2-RMS DIFFERENCE (m): 0.811
NRP Yrcs 2-RMS DIFFERENCE (m): 0.300
NRP Zrcs 2-RMS DIFFERENCE (m): 0.315

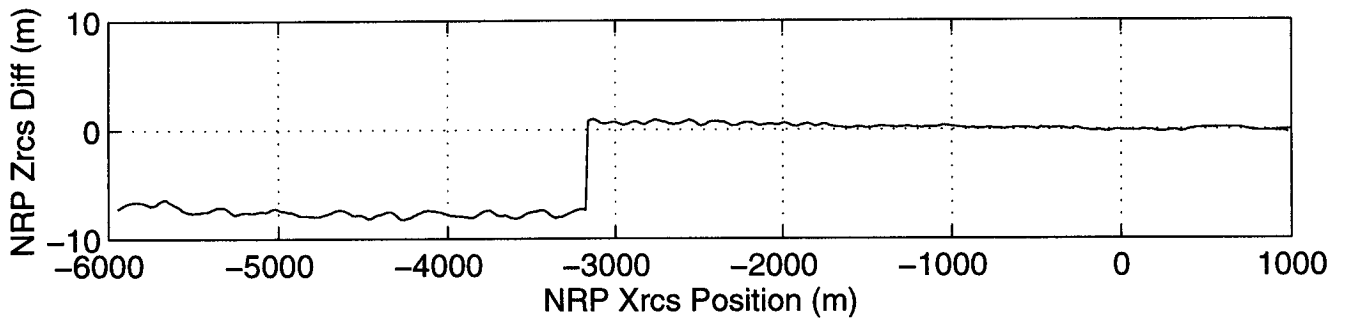
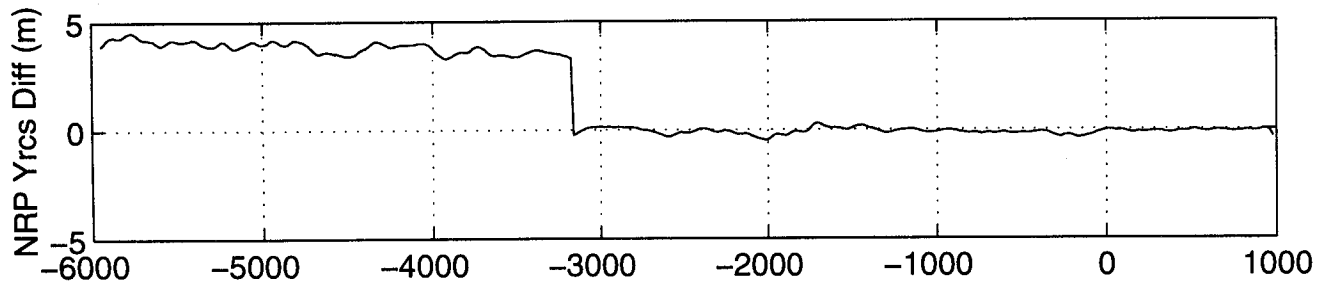
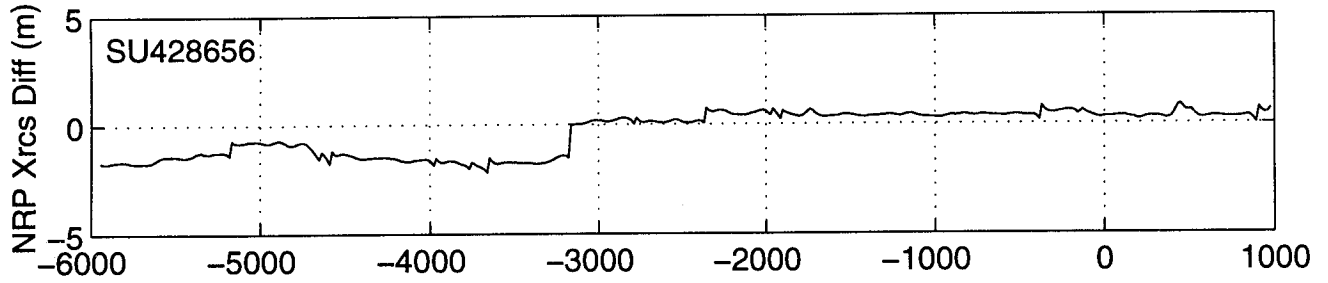
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 163.272
LGRP Yrcs POSITION (m): -0.365





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428658
START TIME: 419632.749
STOP TIME: 419755.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.9
MAXIMUM VDOP: 5.2
AVERAGE VDOP: 5.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.445
NRP Yrcs MEAN DIFFERENCE (m): -0.151
NRP Zrcs MEAN DIFFERENCE (m): 0.124

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.296
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.205
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.224

NRP Xrcs 2-RMS DIFFERENCE (m): 0.939
NRP Yrcs 2-RMS DIFFERENCE (m): 0.366
NRP Zrcs 2-RMS DIFFERENCE (m): 0.334

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 72.744
LGRP Yrcs POSITION (m): 5.606

APPROACH #: SU428658
START TIME: 419632.749
STOP TIME: 419755.999

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.9
MAXIMUM VDOP: 5.2
AVERAGE VDOP: 5.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

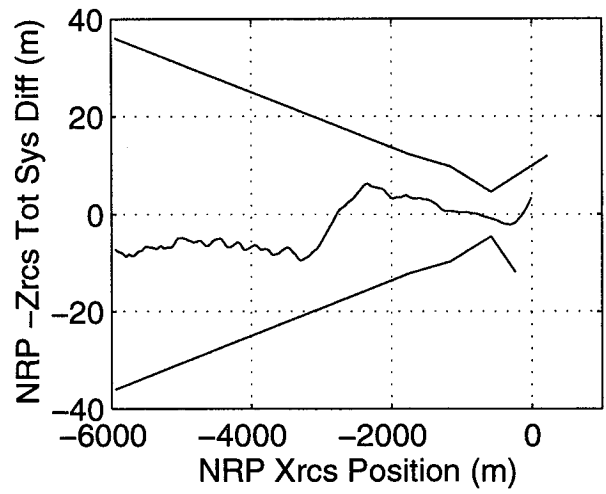
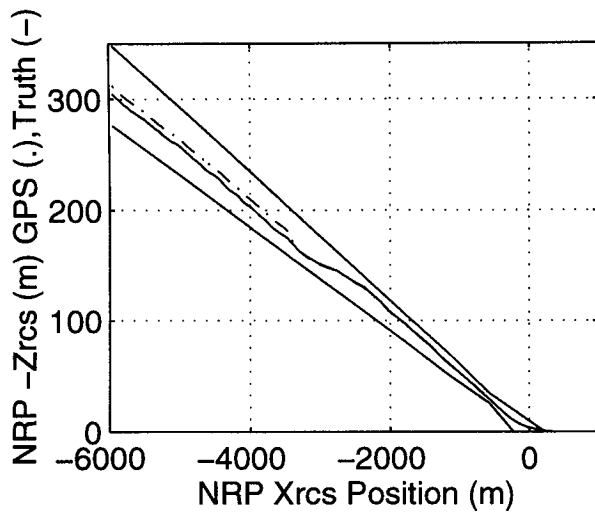
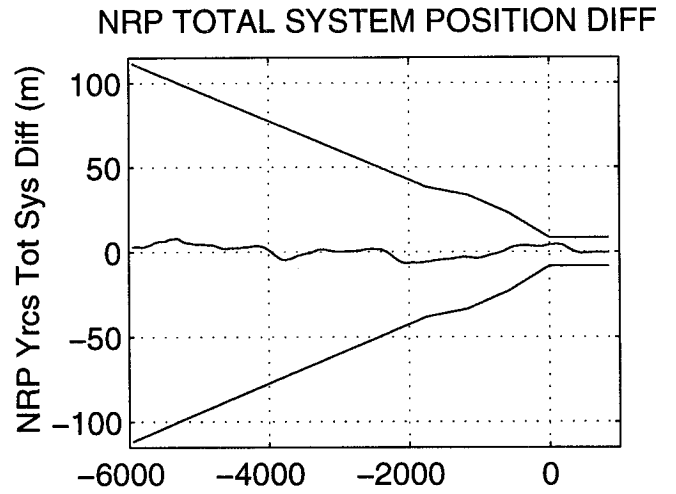
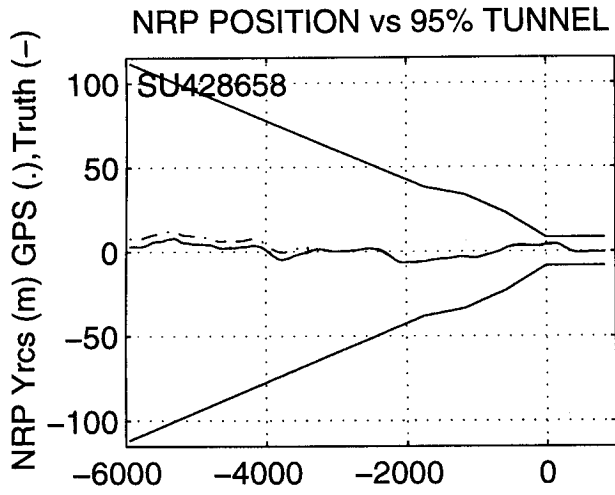
NRP Xrcs MEAN DIFFERENCE (m): 0.445
NRP Yrcs MEAN DIFFERENCE (m): -0.151
NRP Zrcs MEAN DIFFERENCE (m): 0.124

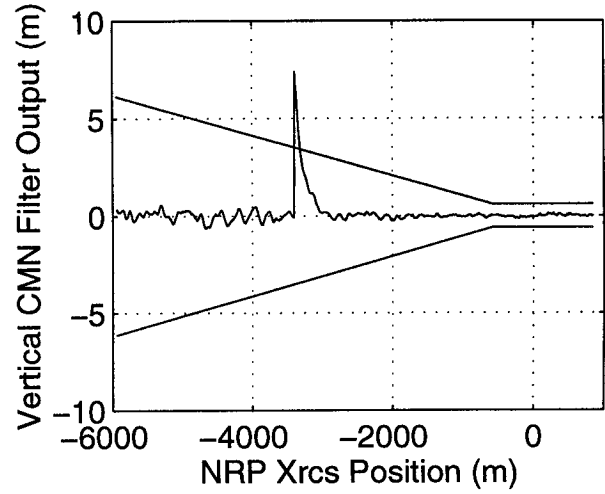
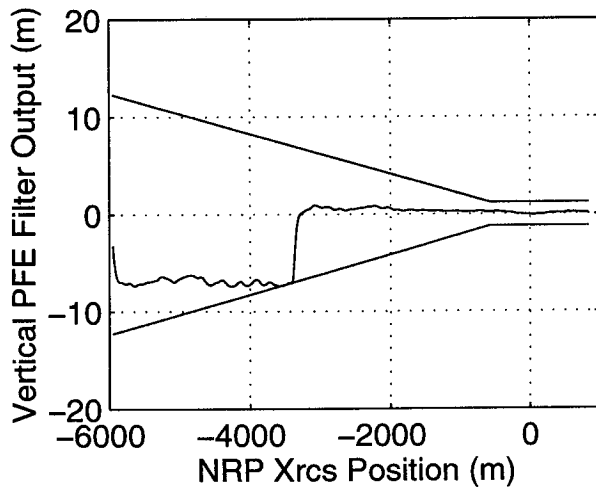
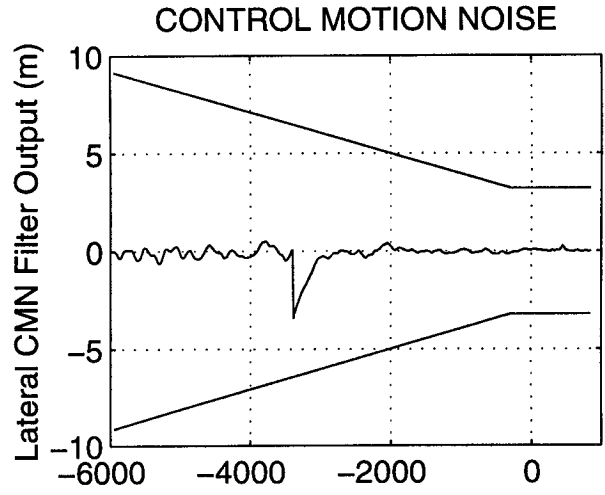
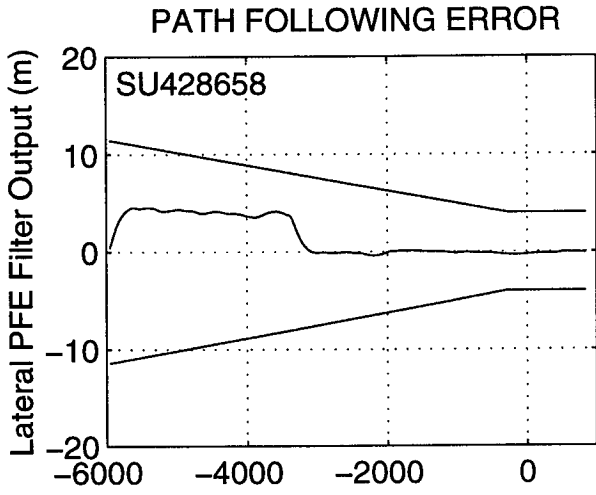
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.296
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.205
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.224

NRP Xrcs 2-RMS DIFFERENCE (m): 0.939
NRP Yrcs 2-RMS DIFFERENCE (m): 0.366
NRP Zrcs 2-RMS DIFFERENCE (m): 0.334

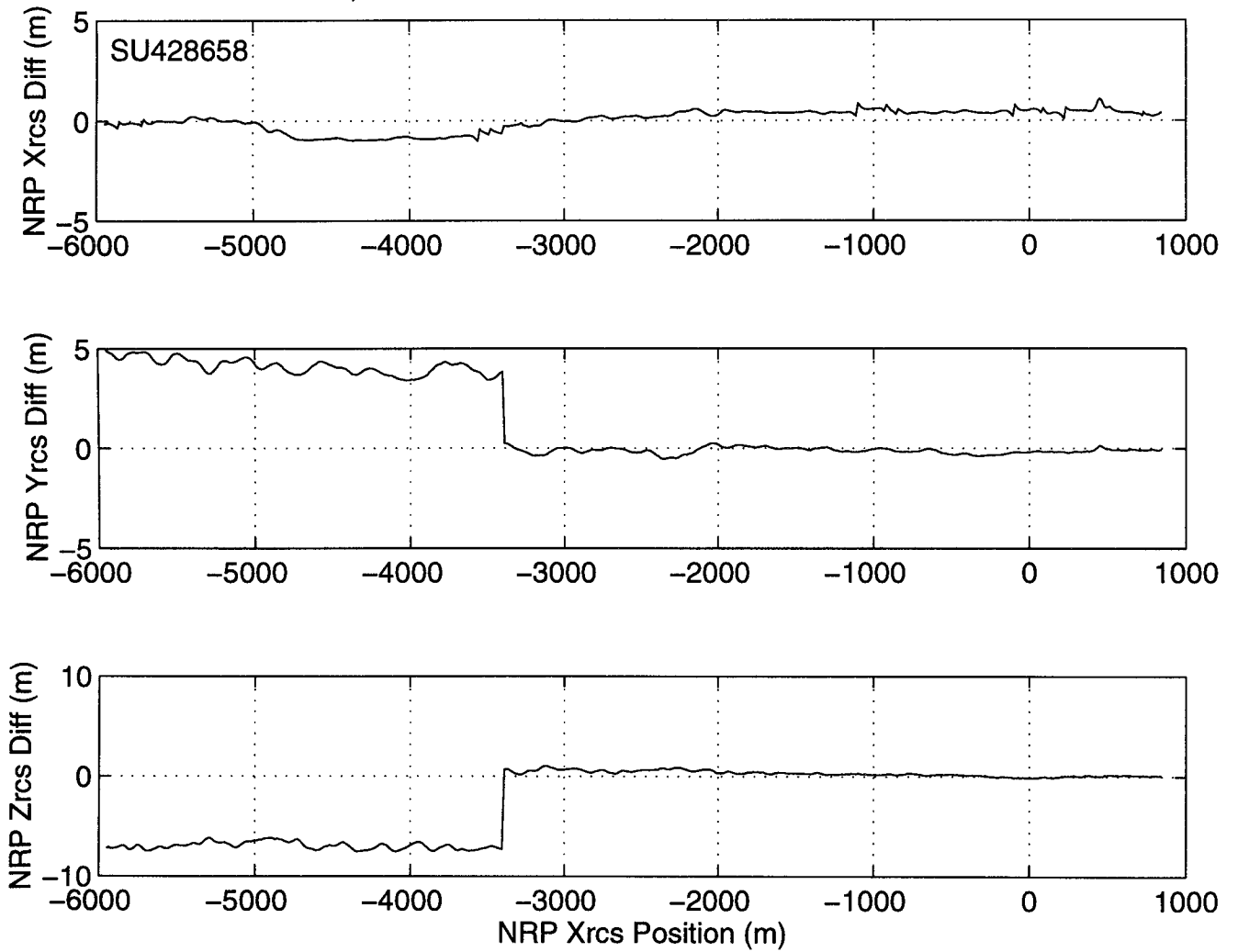
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 72.744
LGRP Yrcs POSITION (m): 5.606





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428660
START TIME: 420597.499
STOP TIME: 420720.249

MINIMUM HDOP: 2.1
MAXIMUM HDOP: 2.1
AVERAGE HDOP: 2.1

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.528
NRP Yrcs MEAN DIFFERENCE (m): -0.104
NRP Zrcs MEAN DIFFERENCE (m): -0.102

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.223
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.190
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.240

NRP Xrcs 2-RMS DIFFERENCE (m): 1.079
NRP Yrcs 2-RMS DIFFERENCE (m): 0.282
NRP Zrcs 2-RMS DIFFERENCE (m): 0.315

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 324.488
LGRP Yrcs POSITION (m): 0.263

APPROACH #: SU428660
START TIME: 420597.499
STOP TIME: 420720.249

MINIMUM HDOP: 2.1
MAXIMUM HDOP: 2.1
AVERAGE HDOP: 2.1

MINIMUM VDOP: 3.4
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

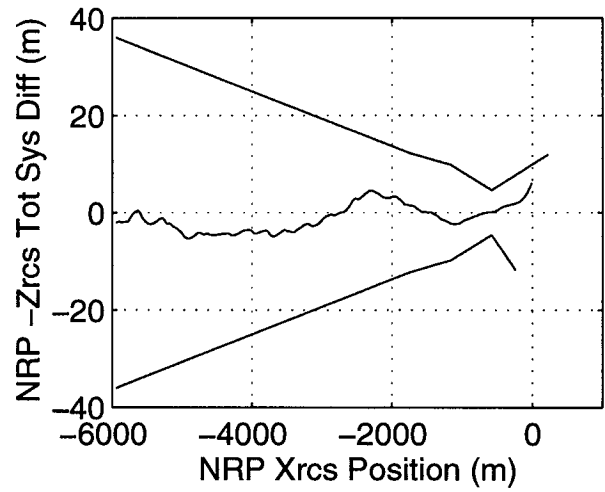
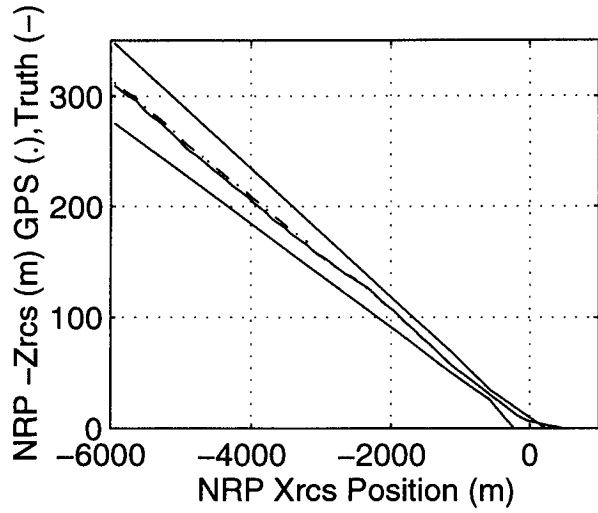
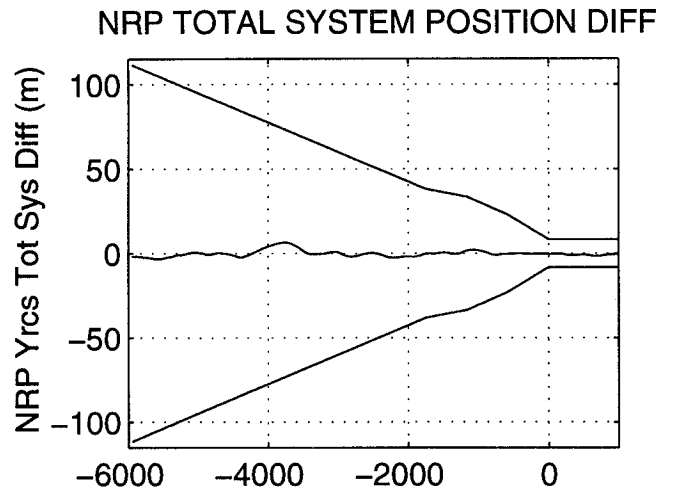
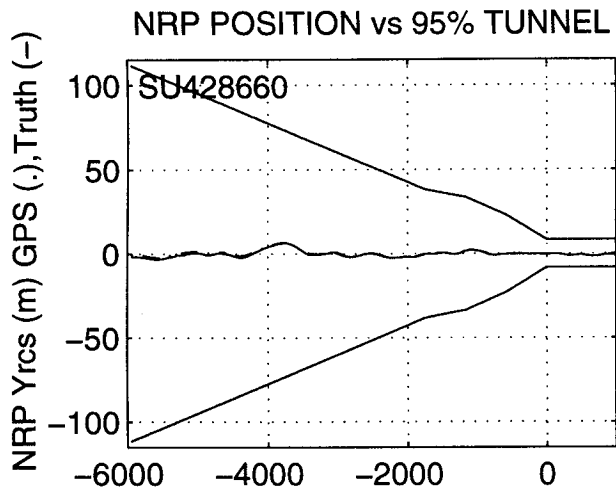
NRP Xrcs MEAN DIFFERENCE (m): 0.528
NRP Yrcs MEAN DIFFERENCE (m): -0.104
NRP Zrcs MEAN DIFFERENCE (m): -0.102

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.223
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.190
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.240

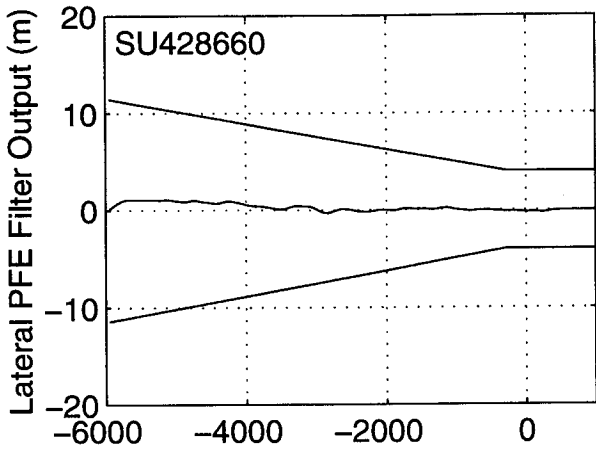
NRP Xrcs 2-RMS DIFFERENCE (m): 1.079
NRP Yrcs 2-RMS DIFFERENCE (m): 0.282
NRP Zrcs 2-RMS DIFFERENCE (m): 0.315

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

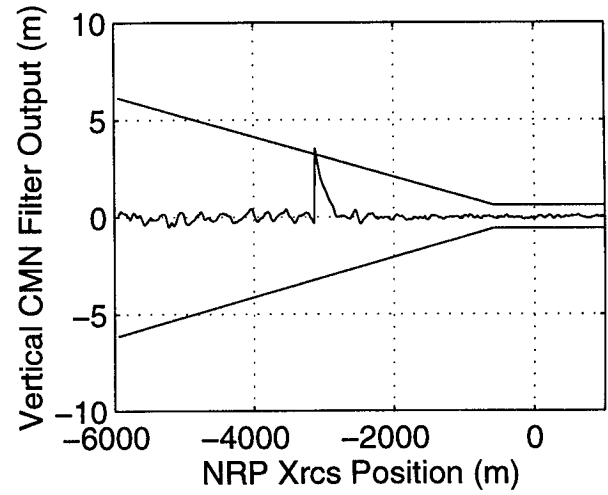
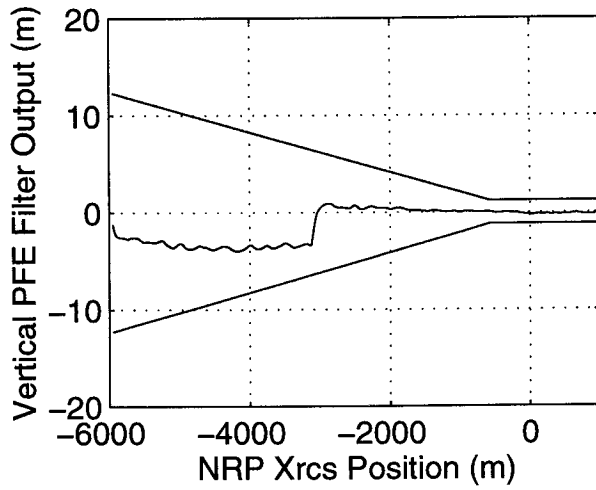
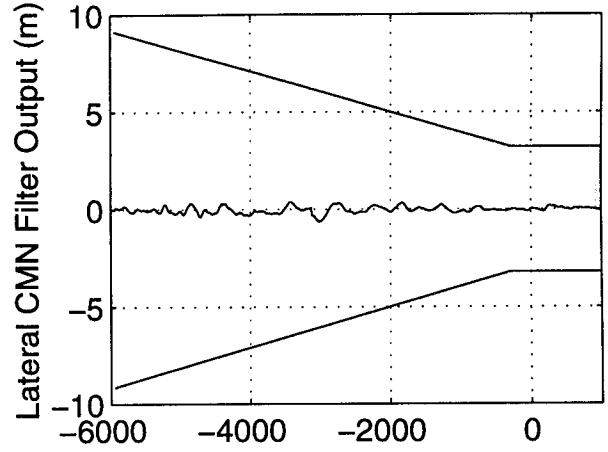
LGRP Xrcs POSITION (m): 324.488
LGRP Yrcs POSITION (m): 0.263



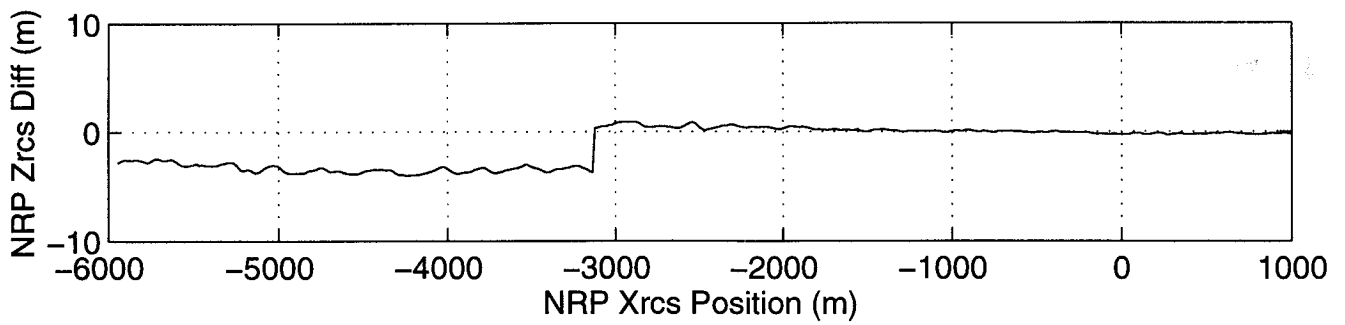
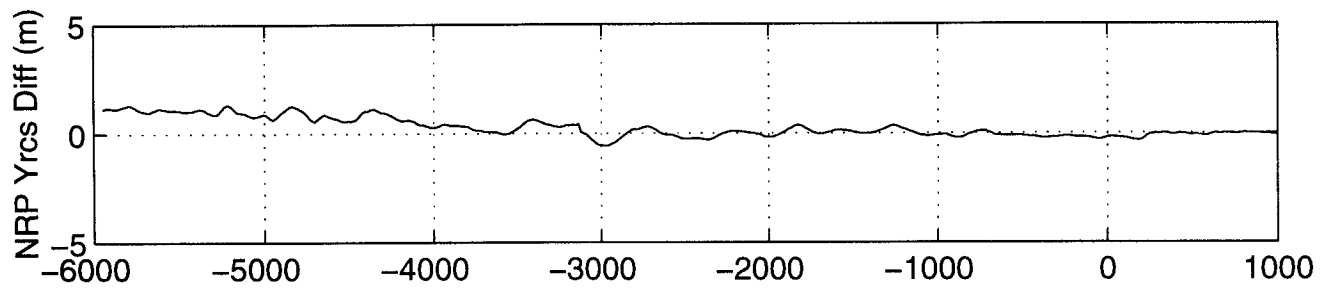
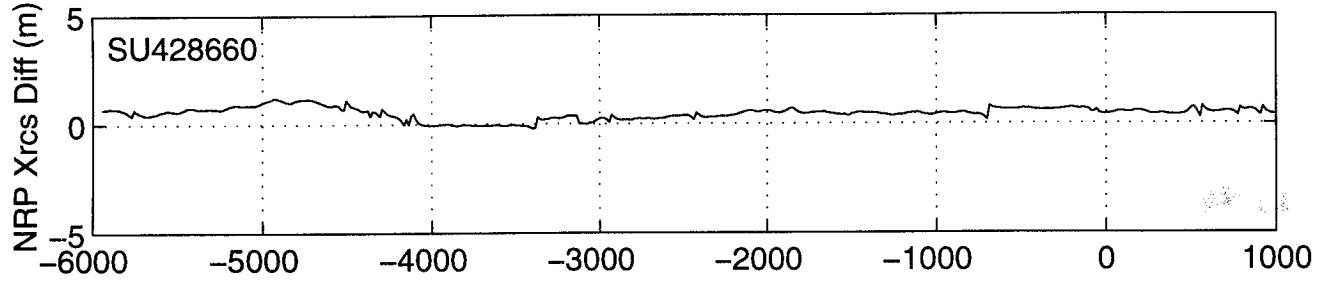
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428662
START TIME: 421020.249
STOP TIME: 421141.249

MINIMUM HDOP: 5.2
MAXIMUM HDOP: 6.0
AVERAGE HDOP: 5.6

MINIMUM VDOP: 12.3
MAXIMUM VDOP: 14.7
AVERAGE VDOP: 13.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 3) DUE TO VIOLATION*
* OF THE VERTICAL TUNNEL BOUNDARY *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.381
NRP Yrcs MEAN DIFFERENCE (m): -0.110
NRP Zrcs MEAN DIFFERENCE (m): 0.128

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.161
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.247

NRP Xrcs 2-RMS DIFFERENCE (m): 0.779
NRP Yrcs 2-RMS DIFFERENCE (m): 0.297
NRP Zrcs 2-RMS DIFFERENCE (m): 0.355

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 343.499
LGRP Yrcs POSITION (m): 0.201

APPROACH #: SU428662
START TIME: 421020.249
STOP TIME: 421141.249

MINIMUM HDOP: 5.2
MAXIMUM HDOP: 6.0
AVERAGE HDOP: 5.6

MINIMUM VDOP: 12.3
MAXIMUM VDOP: 14.7
AVERAGE VDOP: 13.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

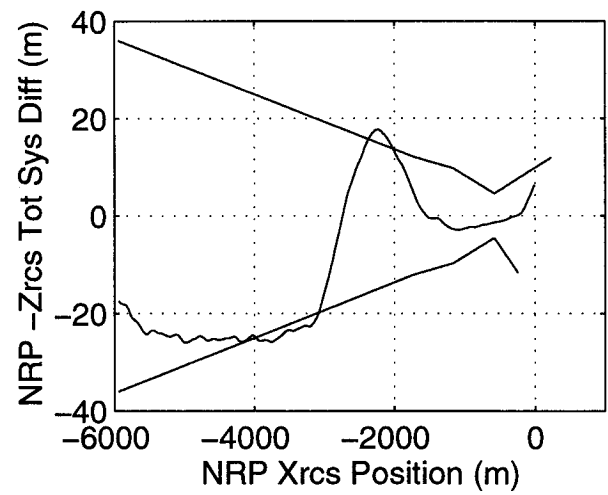
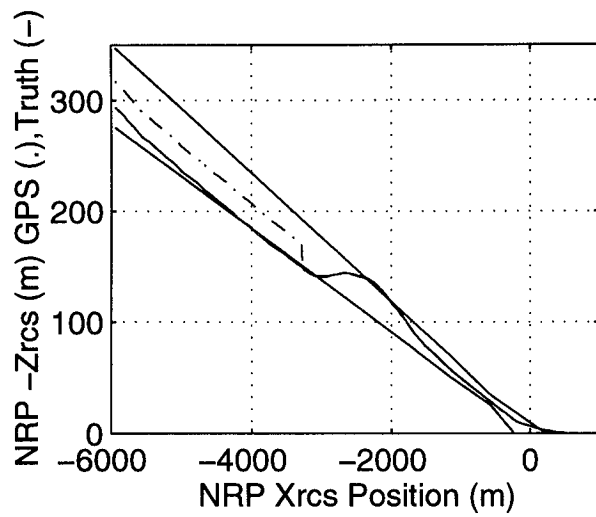
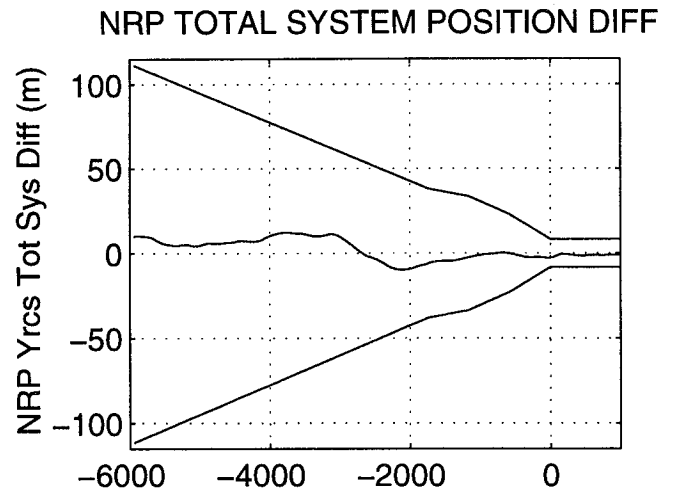
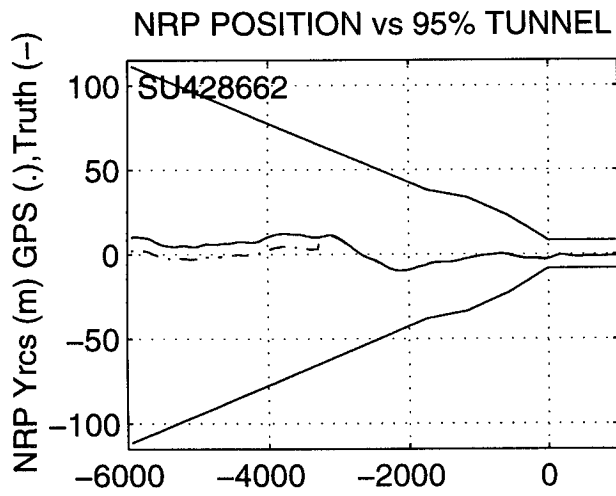
NRP Xrcs MEAN DIFFERENCE (m): 0.381
NRP Yrcs MEAN DIFFERENCE (m): -0.110
NRP Zrcs MEAN DIFFERENCE (m): 0.128

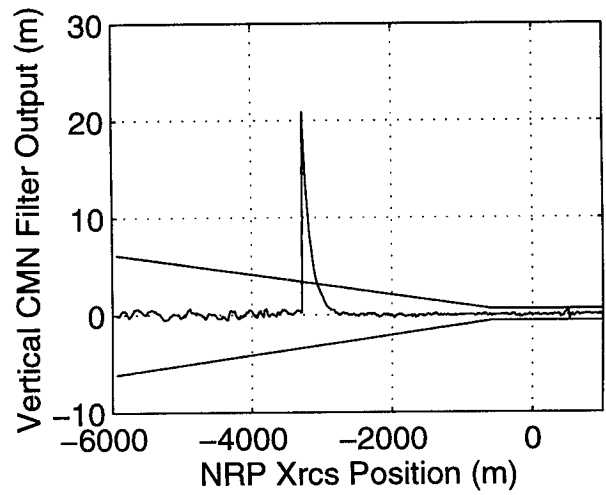
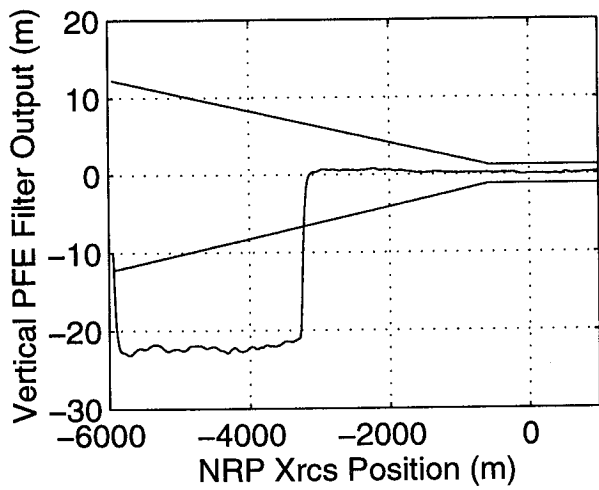
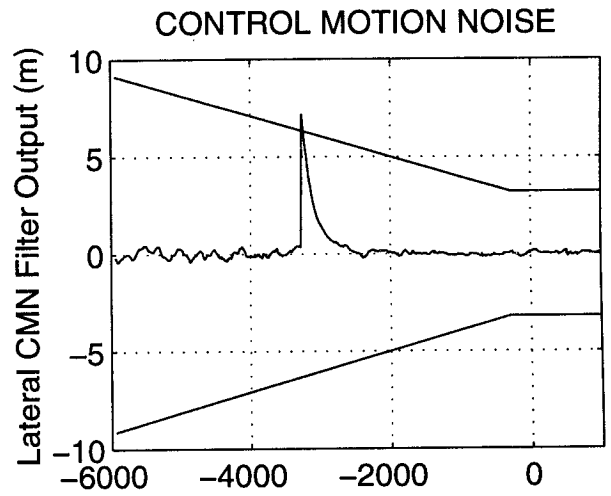
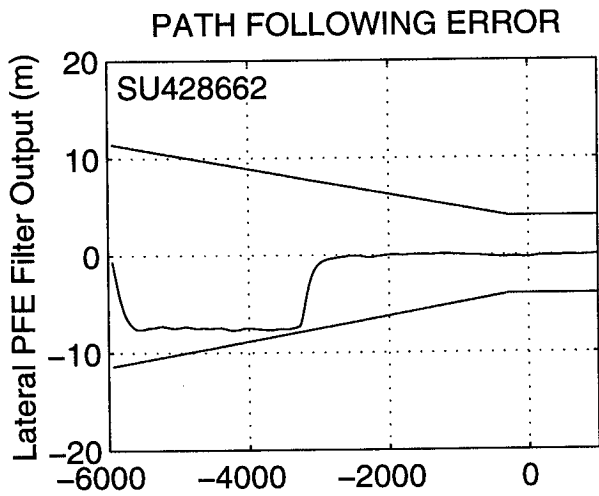
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.161
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.199
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.247

NRP Xrcs 2-RMS DIFFERENCE (m): 0.779
NRP Yrcs 2-RMS DIFFERENCE (m): 0.297
NRP Zrcs 2-RMS DIFFERENCE (m): 0.355

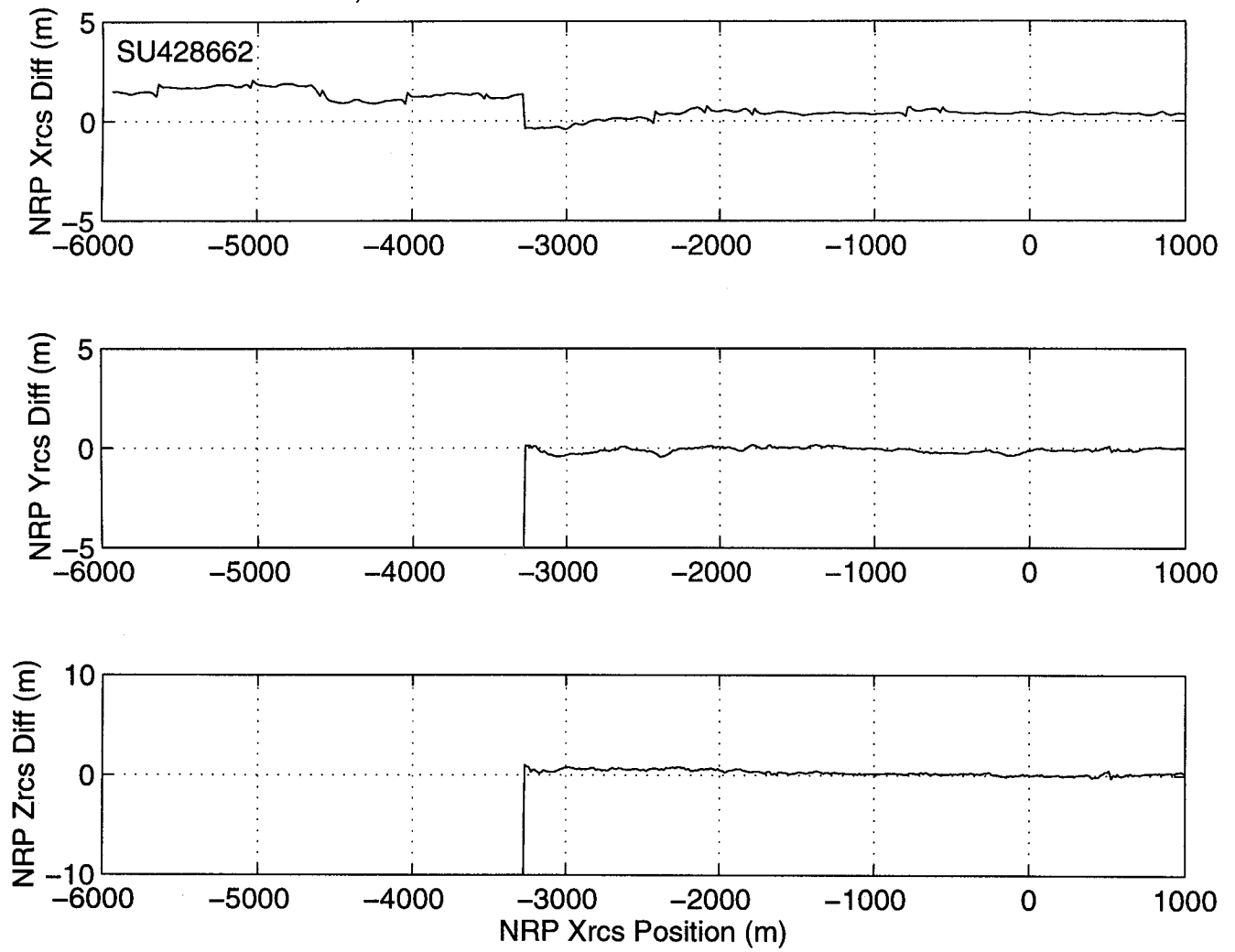
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 343.499
LGRP Yrcs POSITION (m): 0.201





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428664
START TIME: 421436.499
STOP TIME: 421552.499

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.8

MINIMUM VDOP: 7.9
MAXIMUM VDOP: 8.8
AVERAGE VDOP: 8.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.660
NRP Yrcs MEAN DIFFERENCE (m): -0.233
NRP Zrcs MEAN DIFFERENCE (m): -0.026

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.941
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.529
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.288

NRP Xrcs 2-RMS DIFFERENCE (m): 1.622
NRP Yrcs 2-RMS DIFFERENCE (m): 0.706
NRP Zrcs 2-RMS DIFFERENCE (m): 0.293

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 179.324
LGRP Yrcs POSITION (m): 0.315

APPROACH #: SU428664
START TIME: 421436.499
STOP TIME: 421552.499

MINIMUM HDOP: 3.7
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 3.8

MINIMUM VDOP: 7.9
MAXIMUM VDOP: 8.8
AVERAGE VDOP: 8.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN*
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

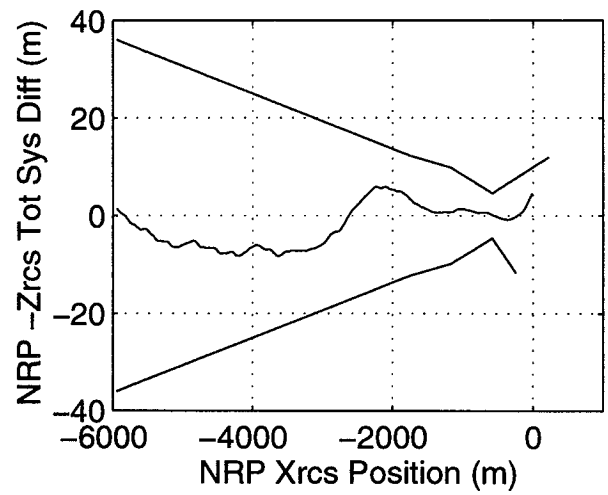
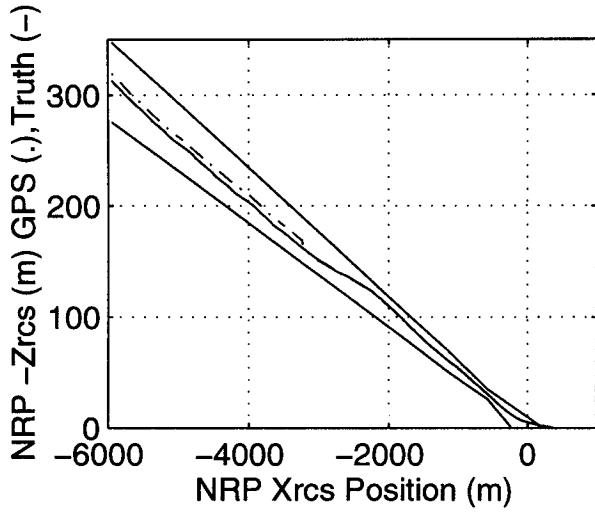
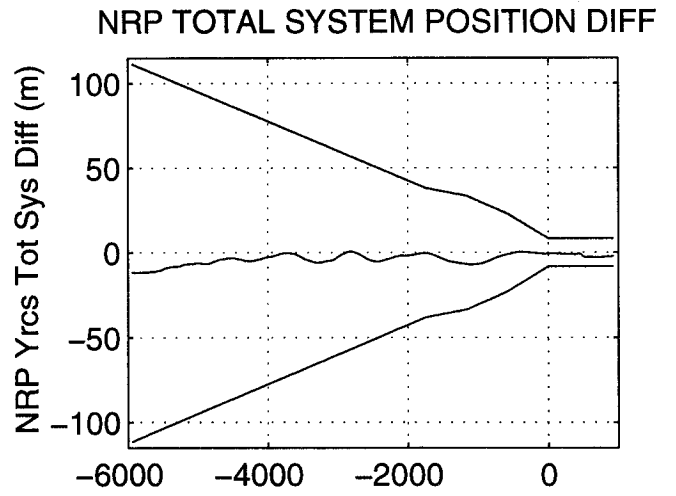
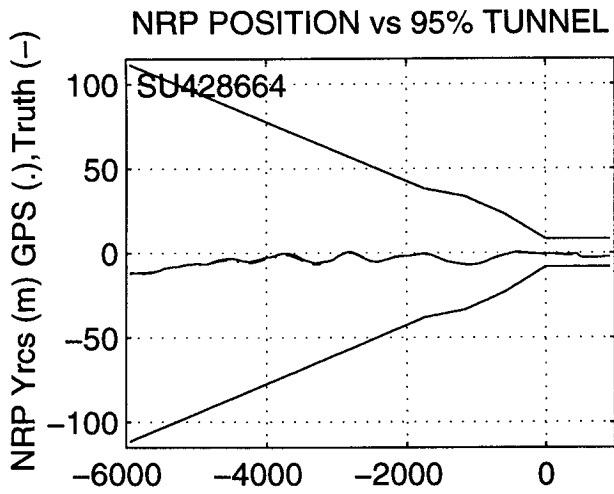
NRP Xrcs MEAN DIFFERENCE (m): 0.660
NRP Yrcs MEAN DIFFERENCE (m): -0.233
NRP Zrcs MEAN DIFFERENCE (m): -0.026

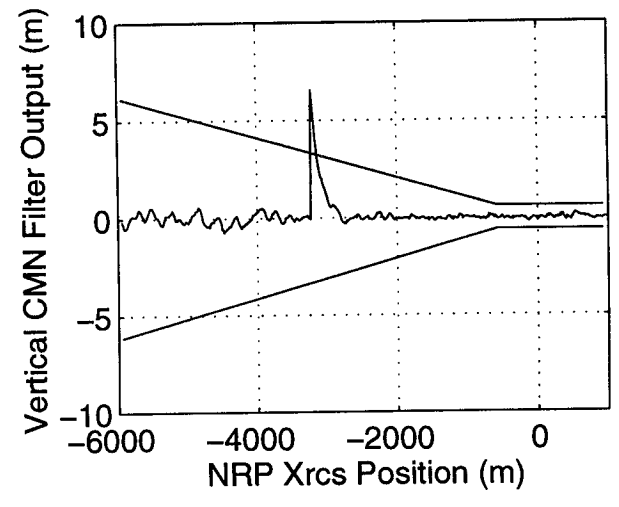
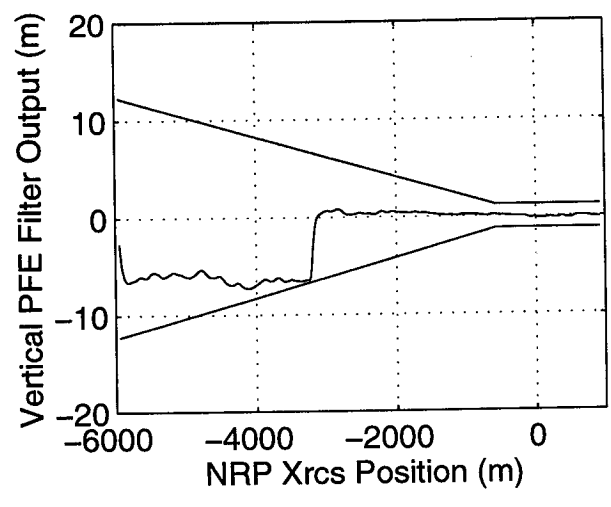
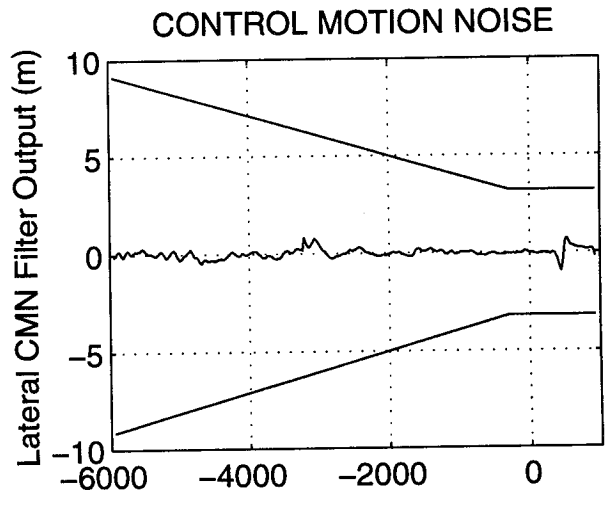
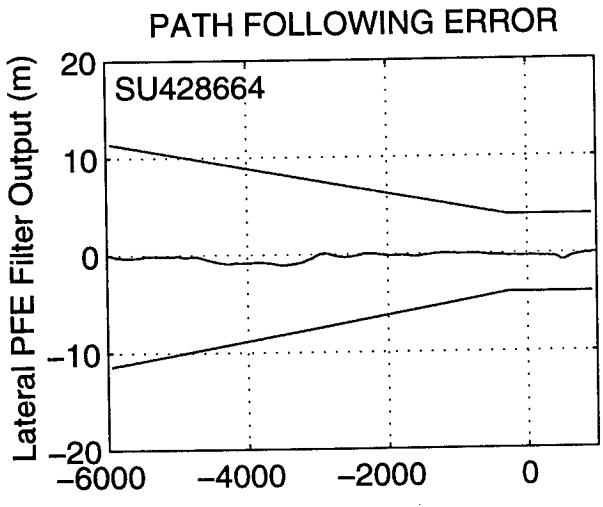
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.941
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.529
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.288

NRP Xrcs 2-RMS DIFFERENCE (m): 1.622
NRP Yrcs 2-RMS DIFFERENCE (m): 0.706
NRP Zrcs 2-RMS DIFFERENCE (m): 0.293

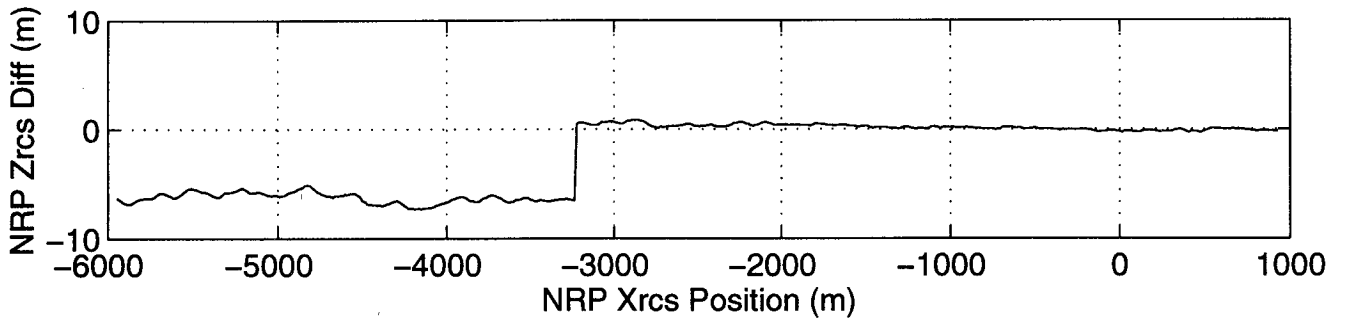
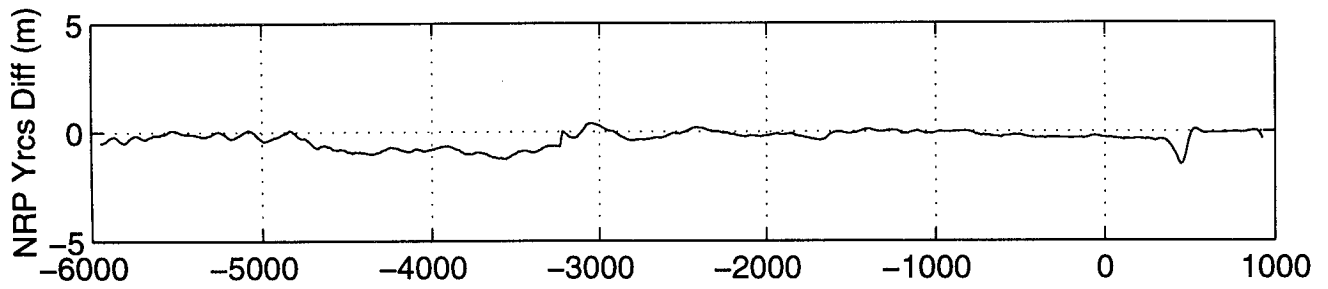
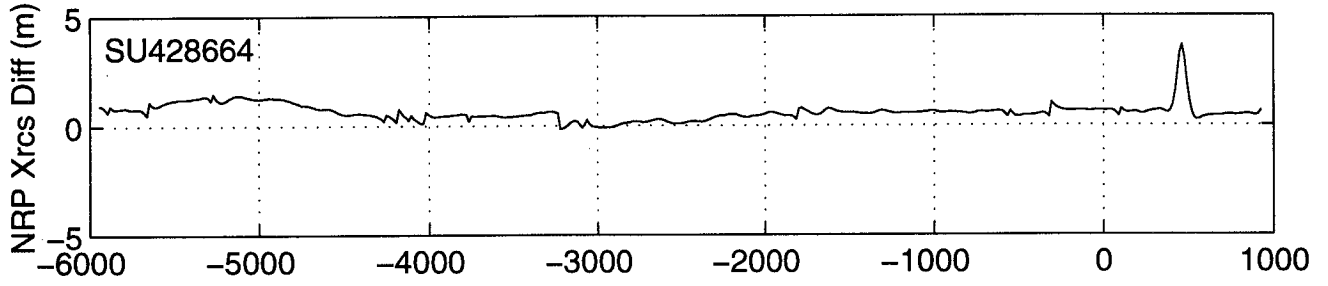
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 179.324
LGRP Yrcs POSITION (m): 0.315





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428702
START TIME: 494928.499
STOP TIME: 495024.499

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 4.0
MAXIMUM VDOP: 4.0
AVERAGE VDOP: 4.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.371
NRP Yrcs MEAN DIFFERENCE (m): -0.111
NRP Zrcs MEAN DIFFERENCE (m): 0.100

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.141
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.229
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.255

NRP Xrcs 2-RMS DIFFERENCE (m): 0.755
NRP Yrcs 2-RMS DIFFERENCE (m): 0.319
NRP Zrcs 2-RMS DIFFERENCE (m): 0.324

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 63.126
LGRP Yrcs POSITION (m): -2.705

APPROACH #: SU428702
START TIME: 494928.499
STOP TIME: 495024.499

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 4.0
MAXIMUM VDOP: 4.0
AVERAGE VDOP: 4.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

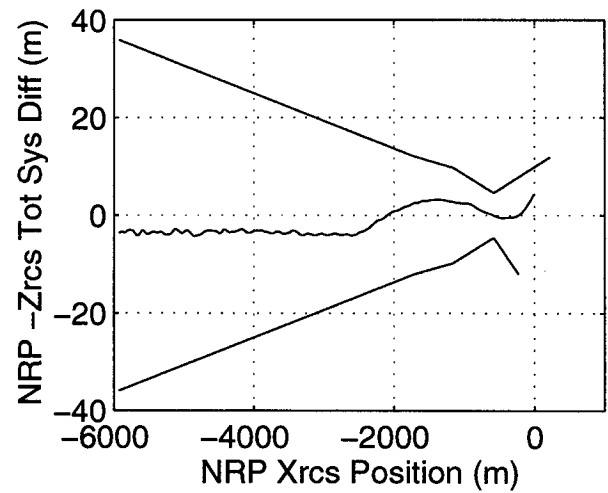
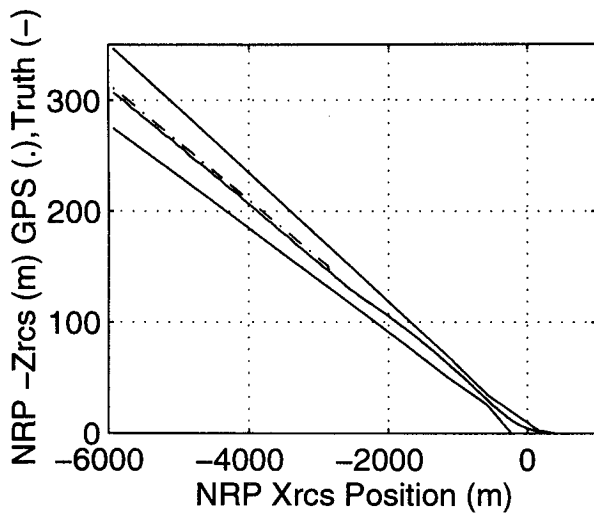
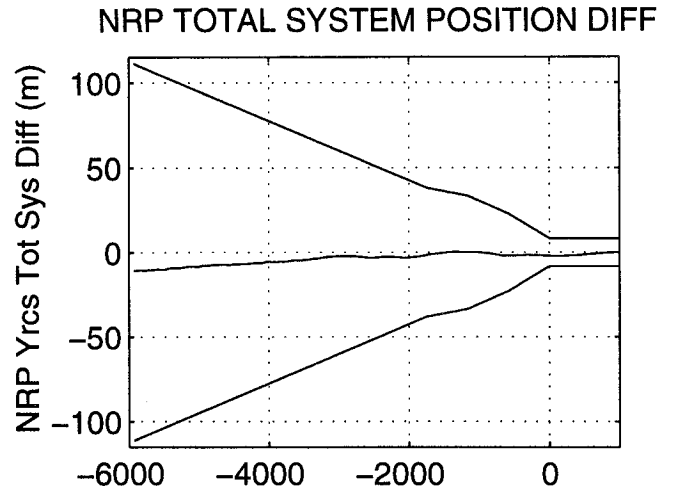
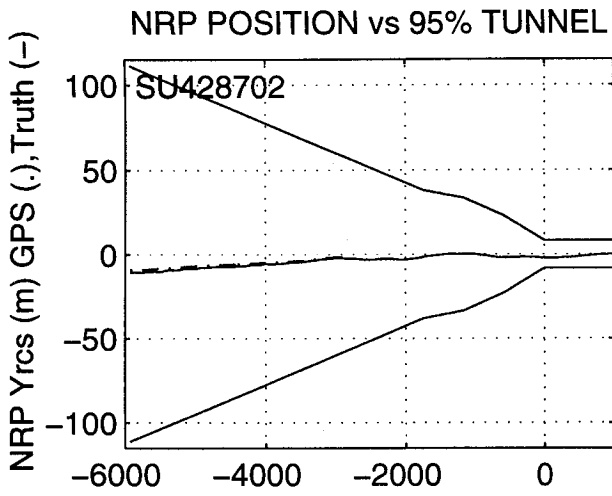
NRP Xrcs MEAN DIFFERENCE (m): 0.371
NRP Yrcs MEAN DIFFERENCE (m): -0.111
NRP Zrcs MEAN DIFFERENCE (m): 0.100

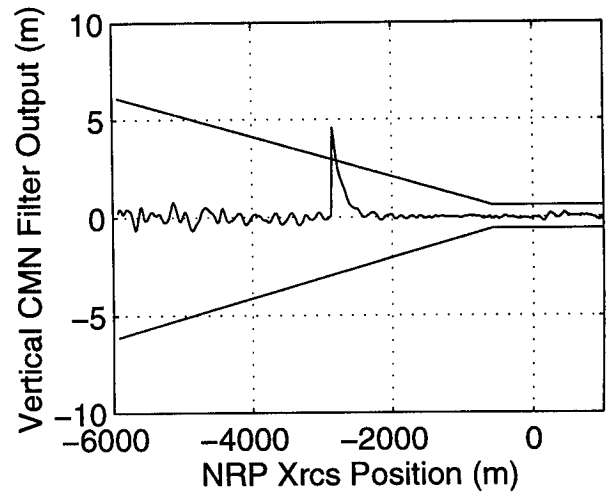
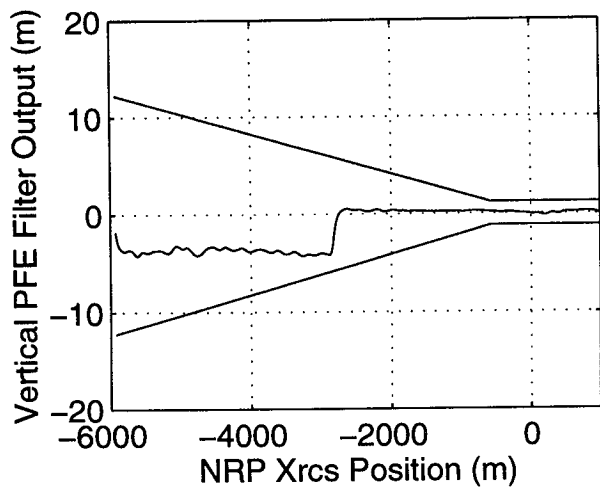
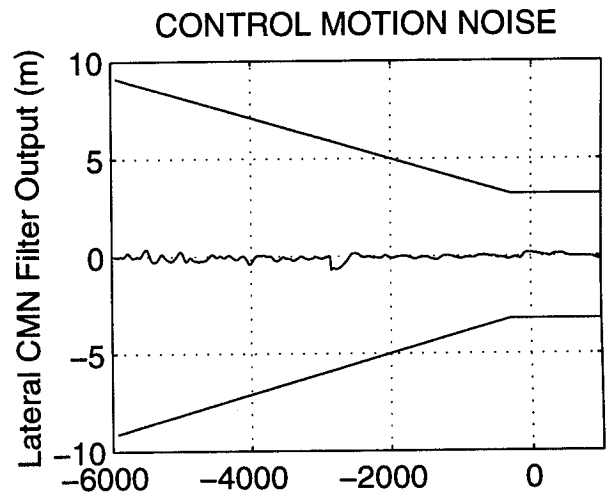
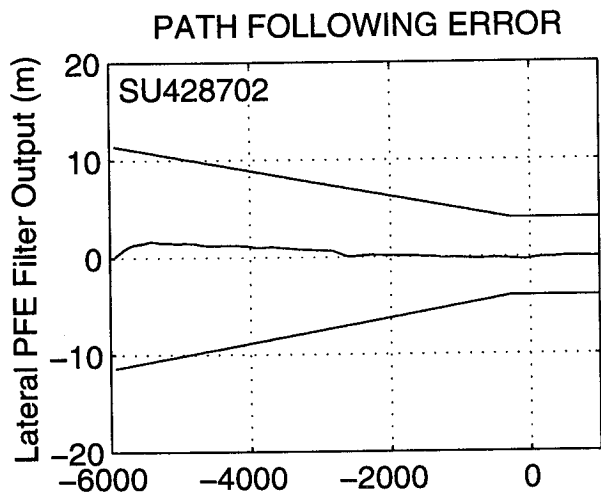
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.141
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.229
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.255

NRP Xrcs 2-RMS DIFFERENCE (m): 0.755
NRP Yrcs 2-RMS DIFFERENCE (m): 0.319
NRP Zrcs 2-RMS DIFFERENCE (m): 0.324

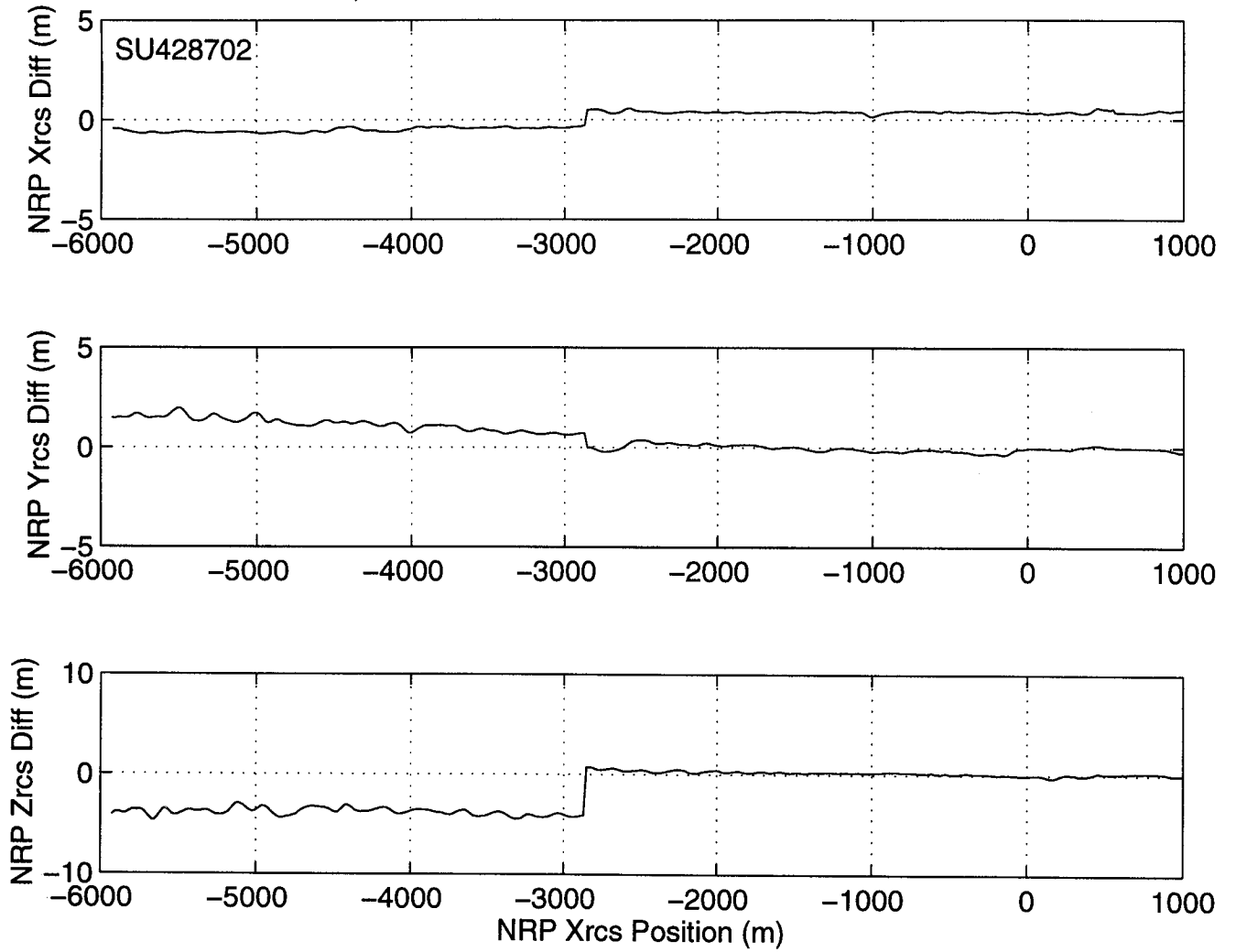
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 63.126
LGRP Yrcs POSITION (m): -2.705





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428704
START TIME: 495379.999
STOP TIME: 495476.499

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.7
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.402
NRP Yrcs MEAN DIFFERENCE (m): -0.116
NRP Zrcs MEAN DIFFERENCE (m): 0.075

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.120
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.152
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.266

NRP Xrcs 2-RMS DIFFERENCE (m): 0.812
NRP Yrcs 2-RMS DIFFERENCE (m): 0.278
NRP Zrcs 2-RMS DIFFERENCE (m): 0.305

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 130.363
LGRP Yrcs POSITION (m): 0.831

APPROACH #: SU428704
START TIME: 495379.999
STOP TIME: 495476.499

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 3.7
MAXIMUM VDOP: 3.7
AVERAGE VDOP: 3.7

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

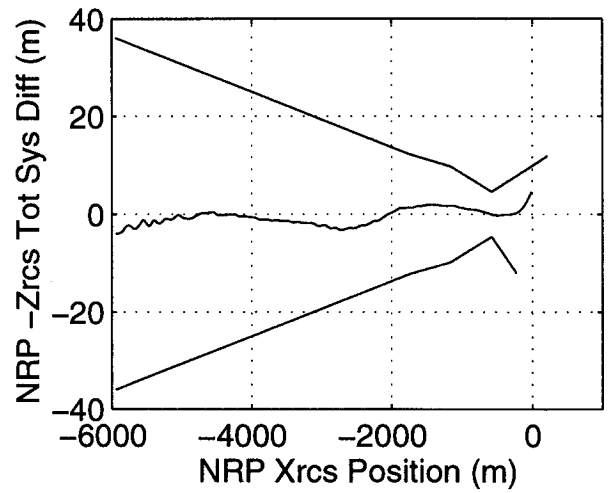
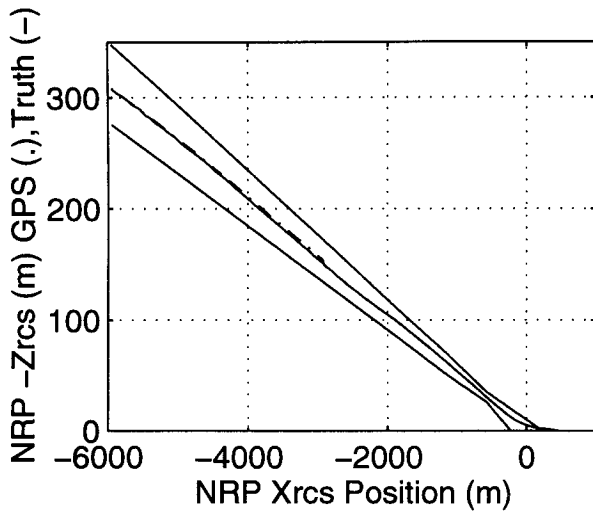
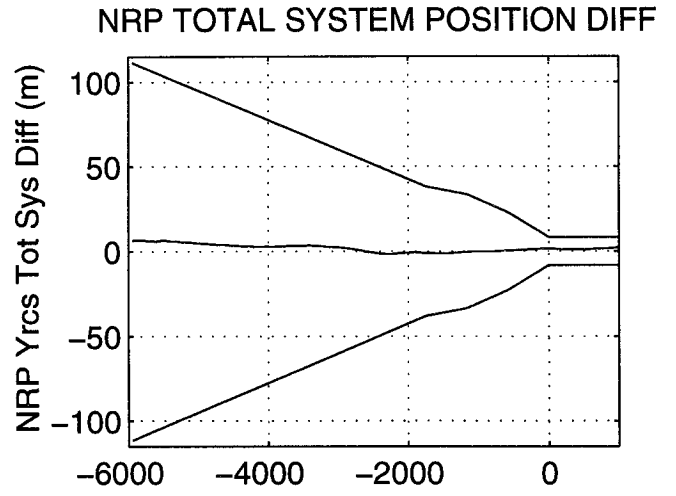
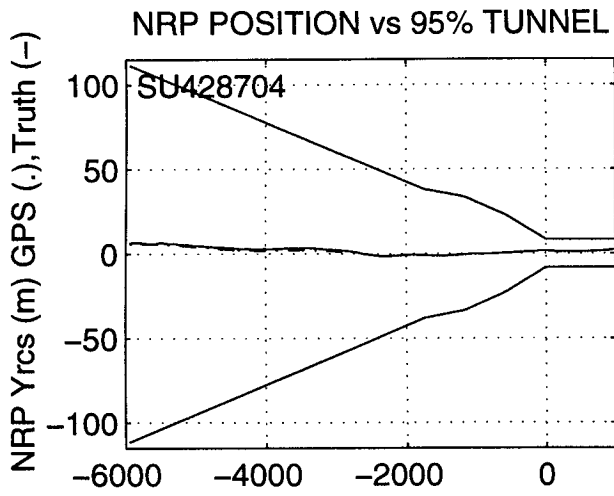
NRP Xrcs MEAN DIFFERENCE (m): 0.402
NRP Yrcs MEAN DIFFERENCE (m): -0.116
NRP Zrcs MEAN DIFFERENCE (m): 0.075

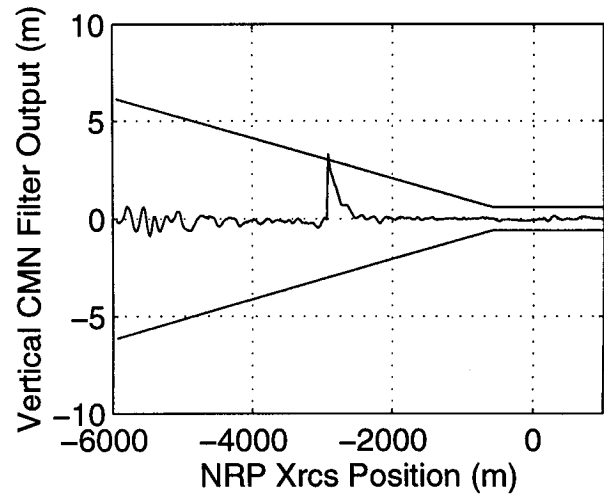
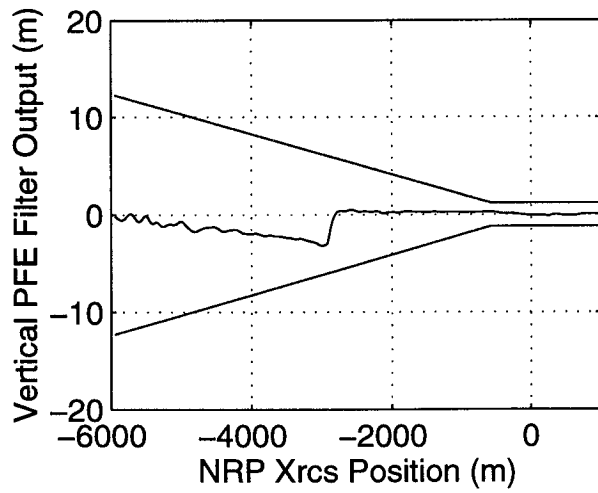
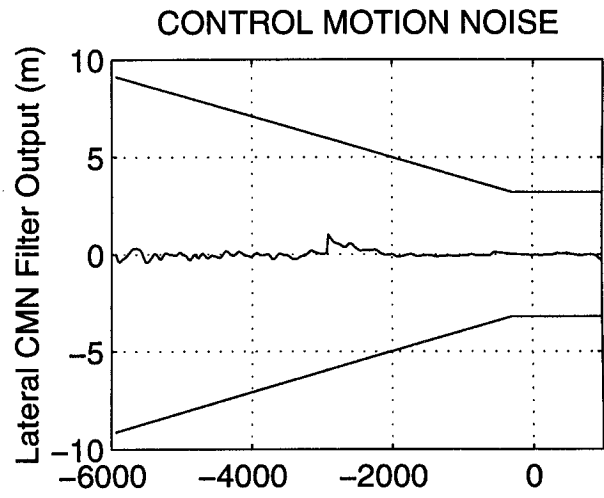
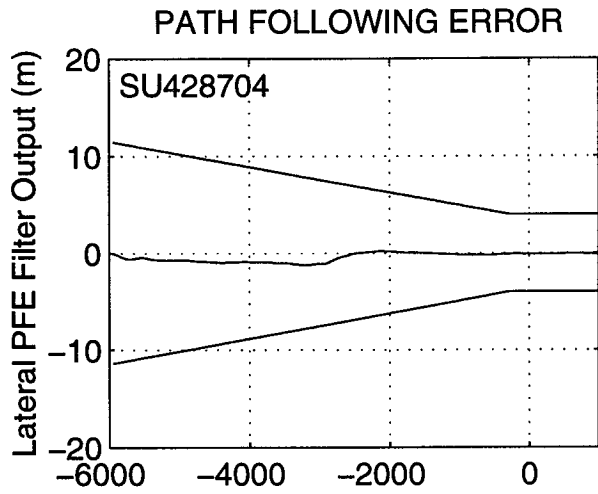
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.120
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.152
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.266

NRP Xrcs 2-RMS DIFFERENCE (m): 0.812
NRP Yrcs 2-RMS DIFFERENCE (m): 0.278
NRP Zrcs 2-RMS DIFFERENCE (m): 0.305

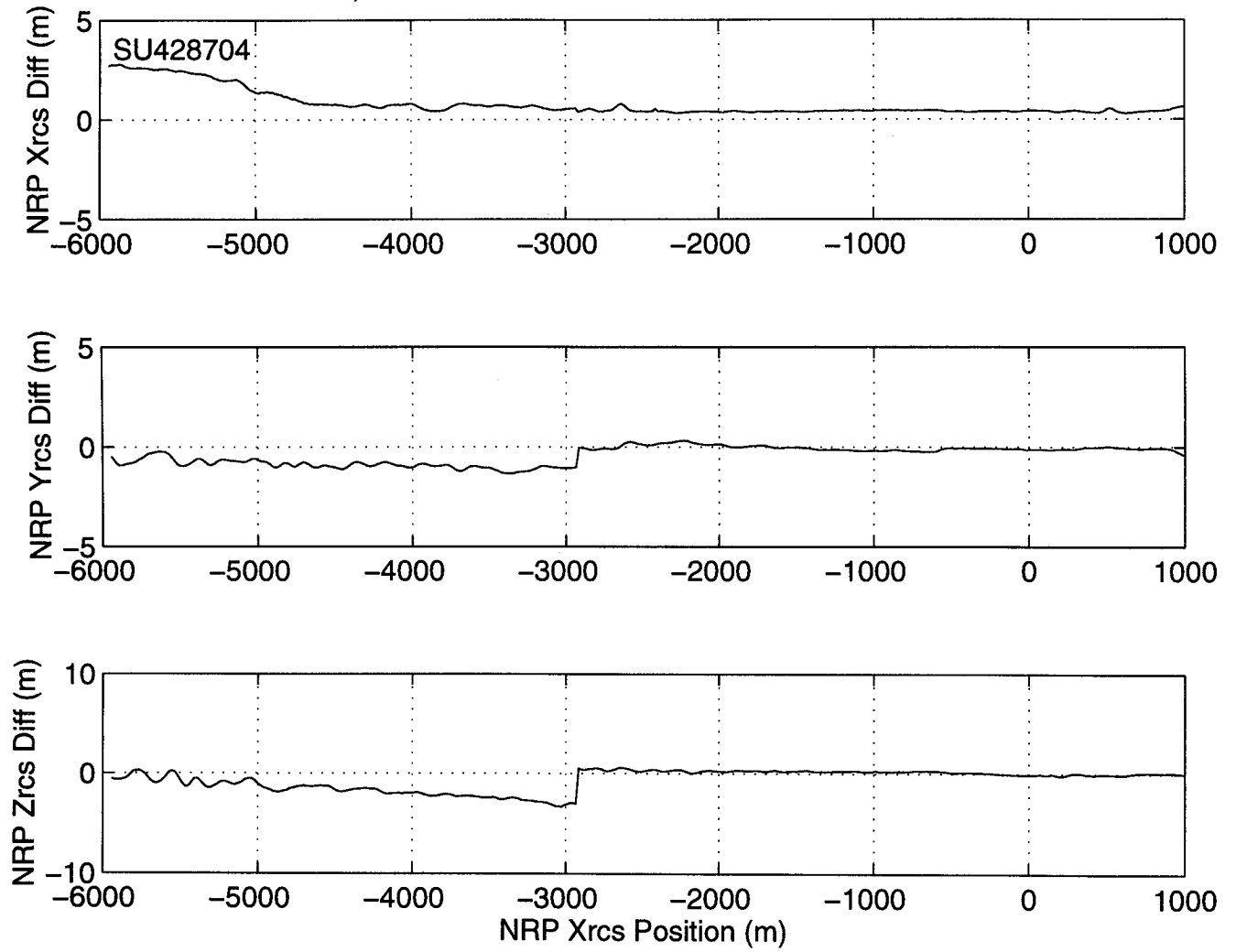
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 130.363
LGRP Yrcs POSITION (m): 0.831





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428706
START TIME: 495787.749
STOP TIME: 495883.999

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.5
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.457
NRP Yrcs MEAN DIFFERENCE (m): -0.155
NRP Zrcs MEAN DIFFERENCE (m): 0.089

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.123
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.242
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.230

NRP Xrcs 2-RMS DIFFERENCE (m): 0.921
NRP Yrcs 2-RMS DIFFERENCE (m): 0.394
NRP Zrcs 2-RMS DIFFERENCE (m): 0.291

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 128.751
LGRP Yrcs POSITION (m): 1.374

APPROACH #: SU428706
START TIME: 495787.749
STOP TIME: 495883.999

MINIMUM HDOP: 2.2
MAXIMUM HDOP: 2.2
AVERAGE HDOP: 2.2

MINIMUM VDOP: 3.5
MAXIMUM VDOP: 3.5
AVERAGE VDOP: 3.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

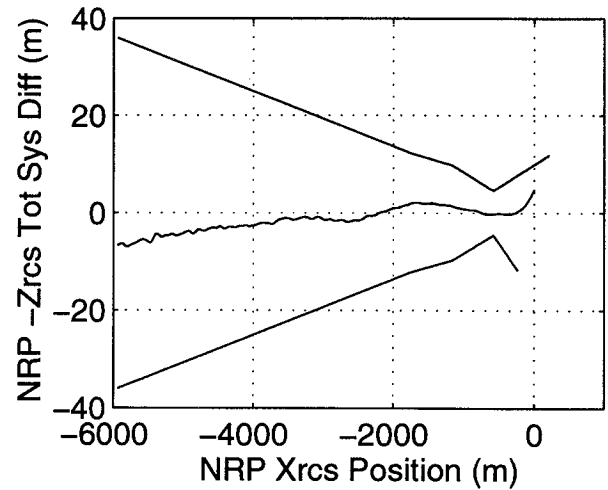
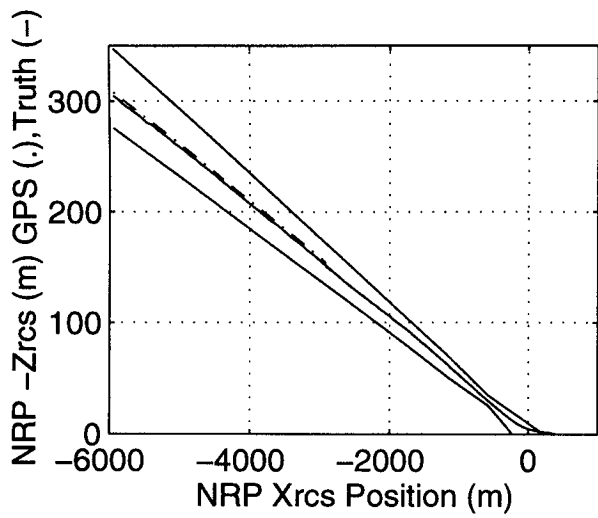
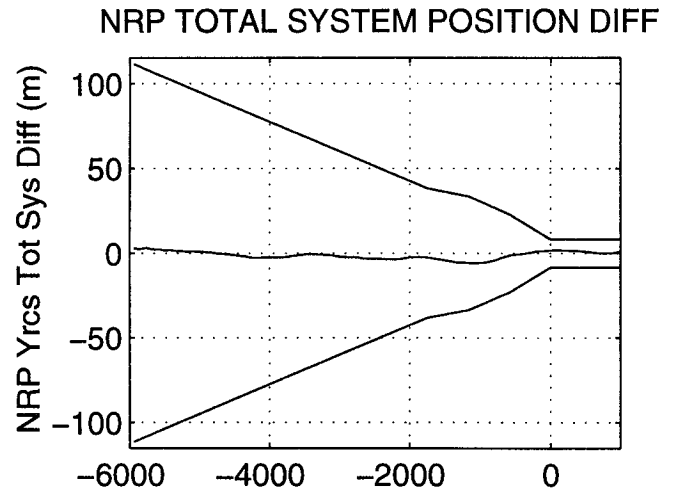
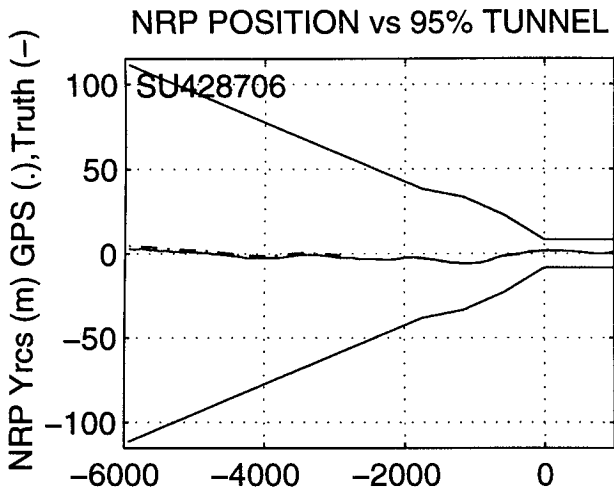
NRP Xrcs MEAN DIFFERENCE (m): 0.457
NRP Yrcs MEAN DIFFERENCE (m): -0.155
NRP Zrcs MEAN DIFFERENCE (m): 0.089

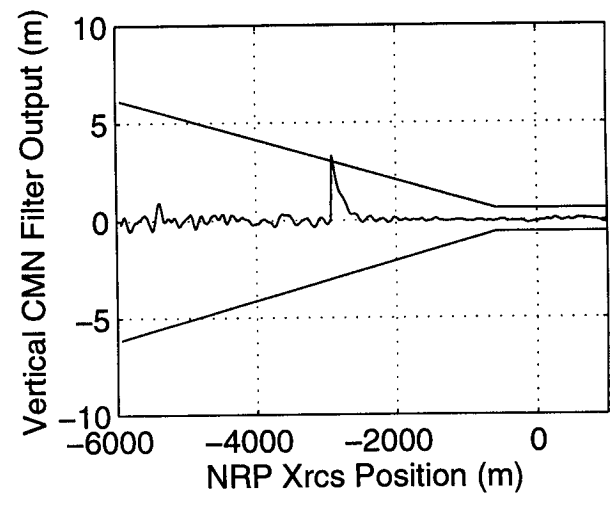
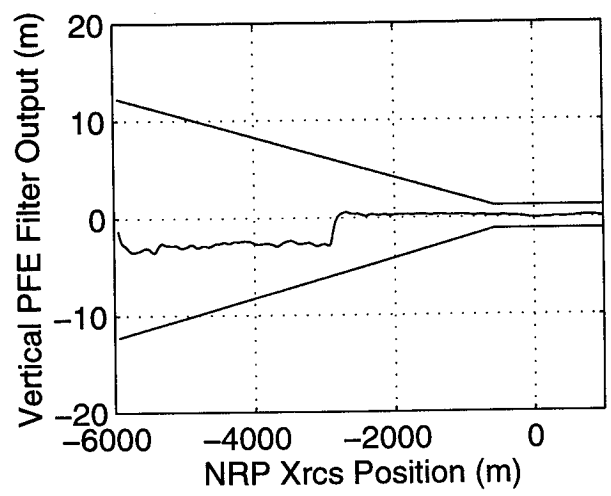
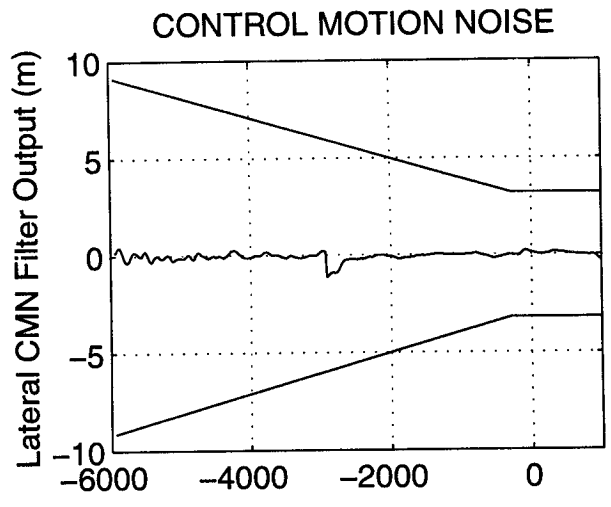
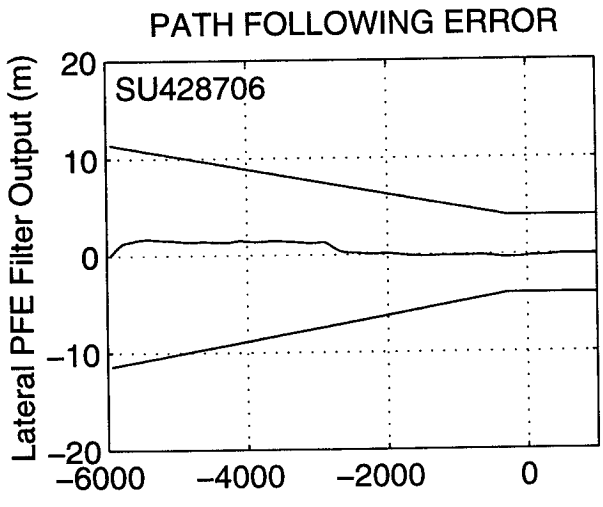
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.123
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.242
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.230

NRP Xrcs 2-RMS DIFFERENCE (m): 0.921
NRP Yrcs 2-RMS DIFFERENCE (m): 0.394
NRP Zrcs 2-RMS DIFFERENCE (m): 0.291

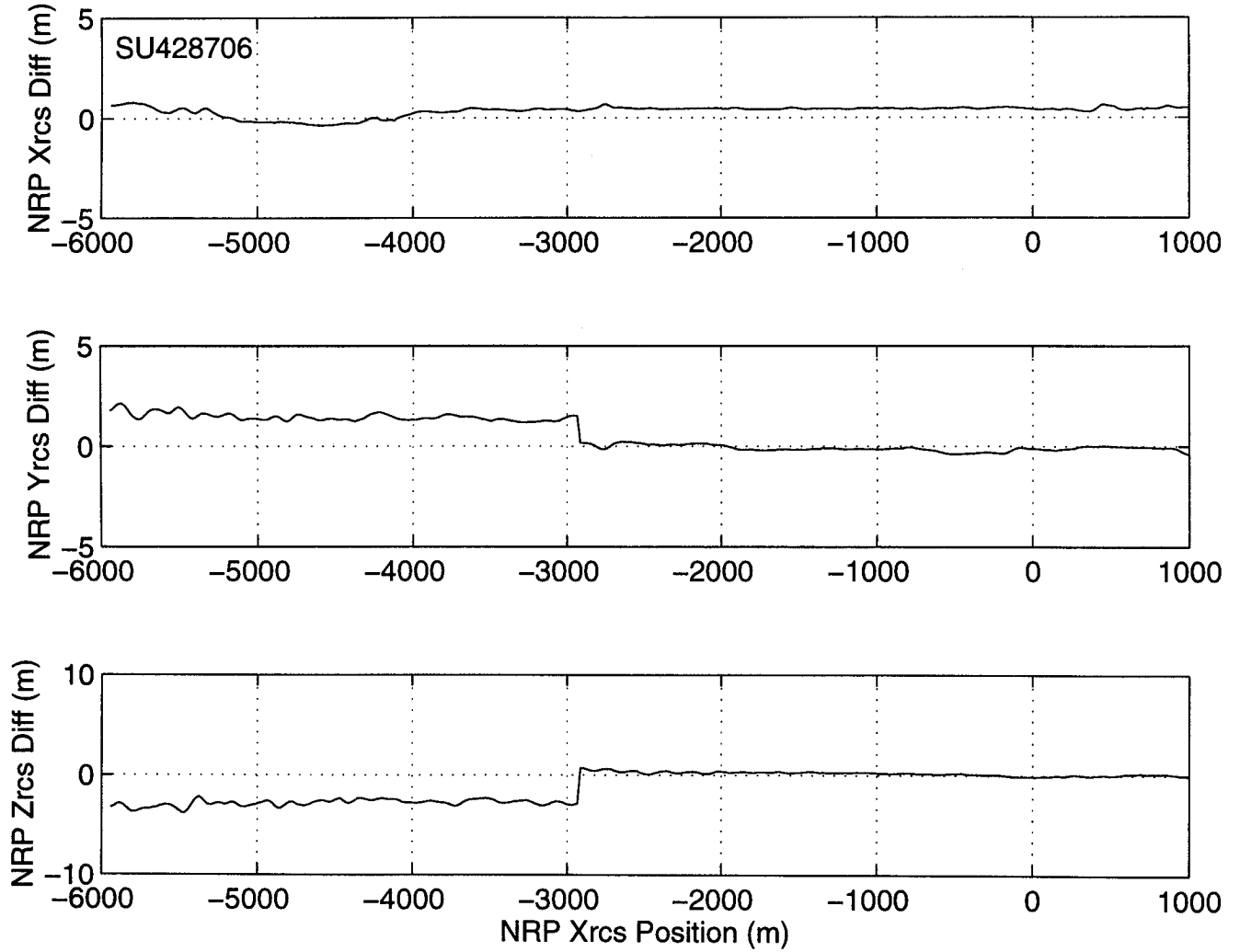
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 128.751
LGRP Yrcs POSITION (m): 1.374





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428708
START TIME: 496206.999
STOP TIME: 496303.749

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 4.3
MAXIMUM VDOP: 4.4
AVERAGE VDOP: 4.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.523
NRP Yrcs MEAN DIFFERENCE (m): -0.123
NRP Zrcs MEAN DIFFERENCE (m): 0.118

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.095
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.192
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.246

NRP Xrcs 2-RMS DIFFERENCE (m): 1.050
NRP Yrcs 2-RMS DIFFERENCE (m): 0.312
NRP Zrcs 2-RMS DIFFERENCE (m): 0.341

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 136.857
LGRP Yrcs POSITION (m): -1.208

APPROACH #: SU428708
START TIME: 496206.999
STOP TIME: 496303.749

MINIMUM HDOP: 2.3
MAXIMUM HDOP: 2.3
AVERAGE HDOP: 2.3

MINIMUM VDOP: 4.3
MAXIMUM VDOP: 4.4
AVERAGE VDOP: 4.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

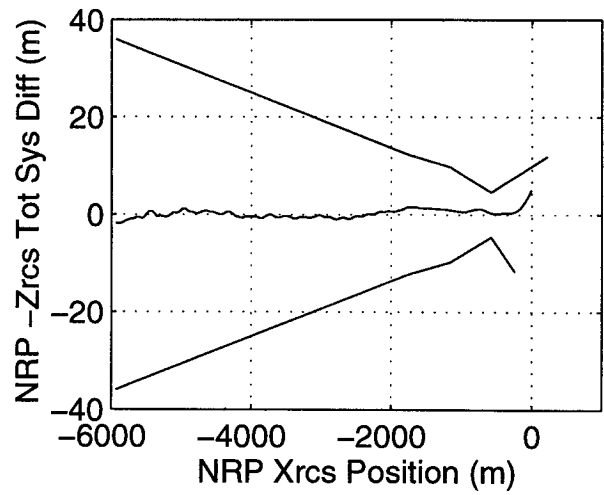
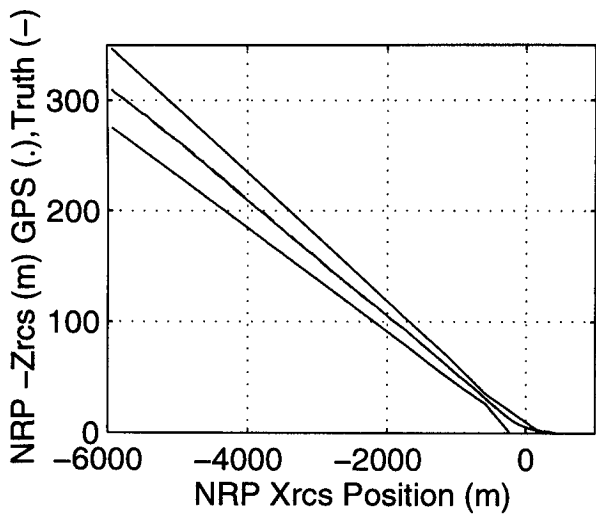
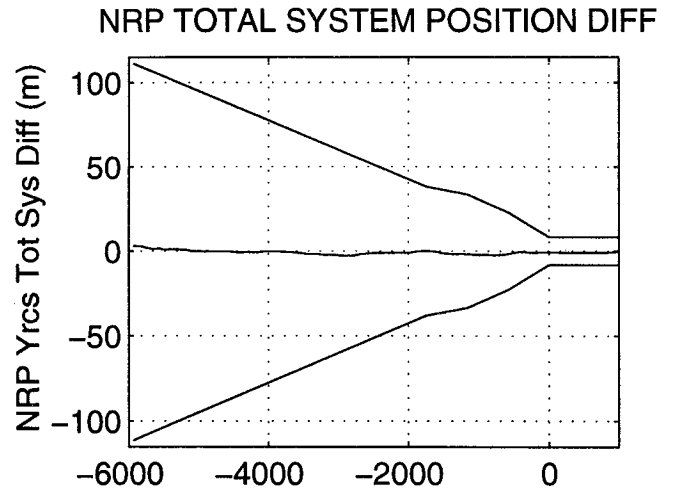
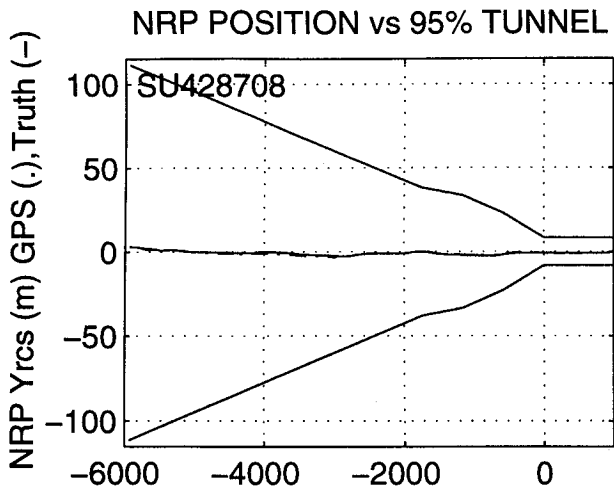
NRP Xrcs MEAN DIFFERENCE (m): 0.523
NRP Yrcs MEAN DIFFERENCE (m): -0.123
NRP Zrcs MEAN DIFFERENCE (m): 0.118

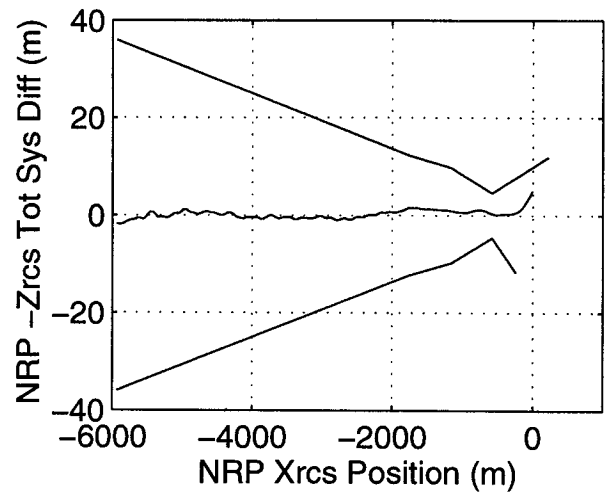
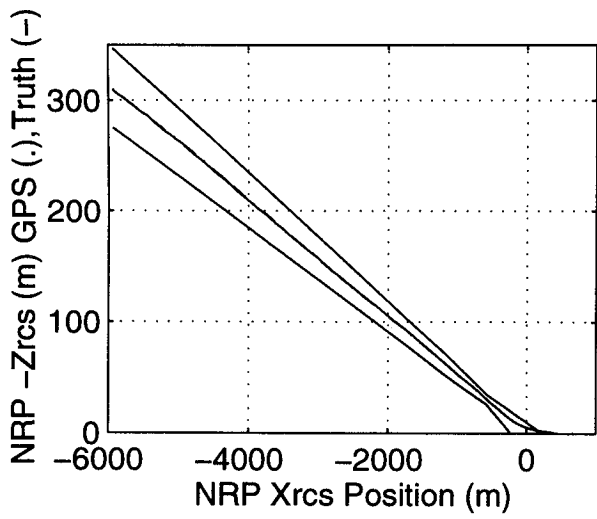
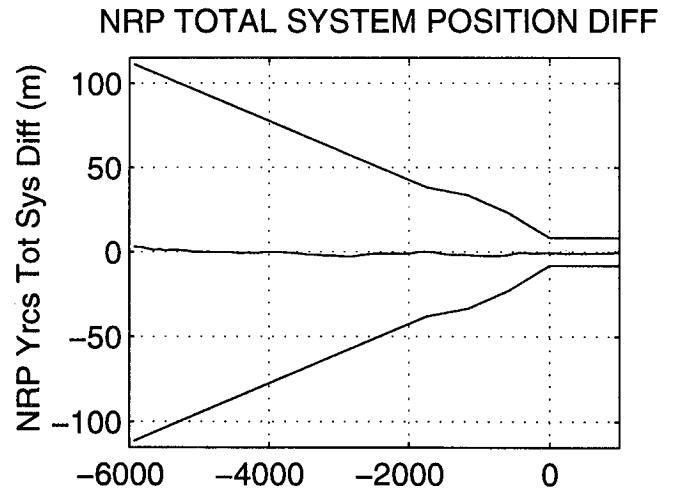
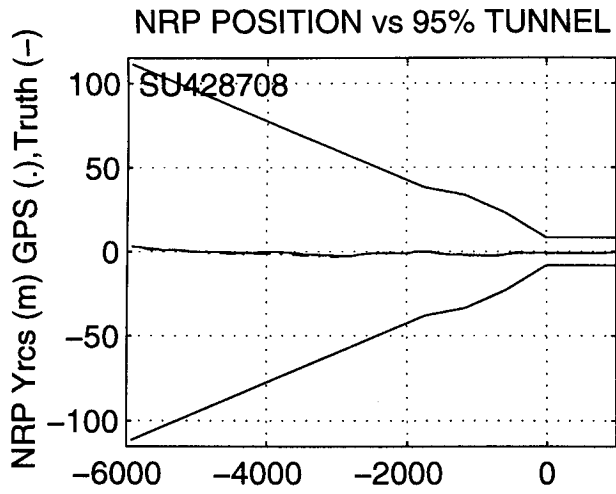
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.095
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.192
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.246

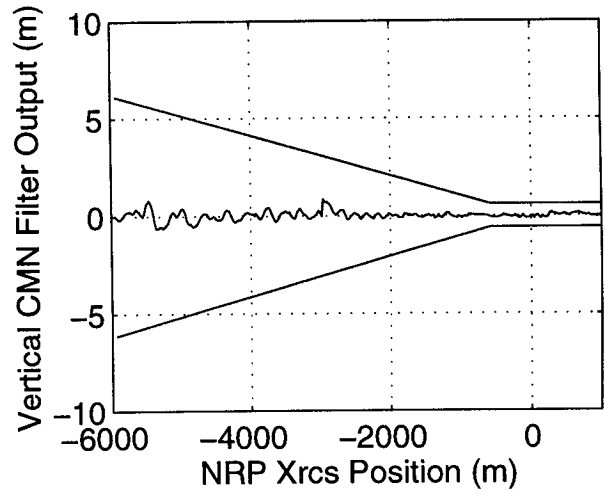
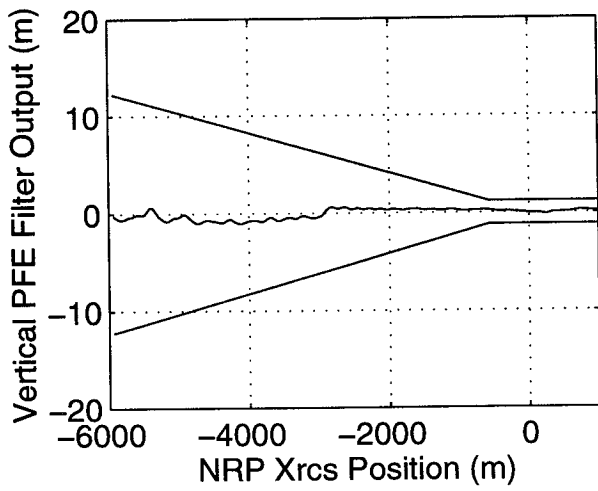
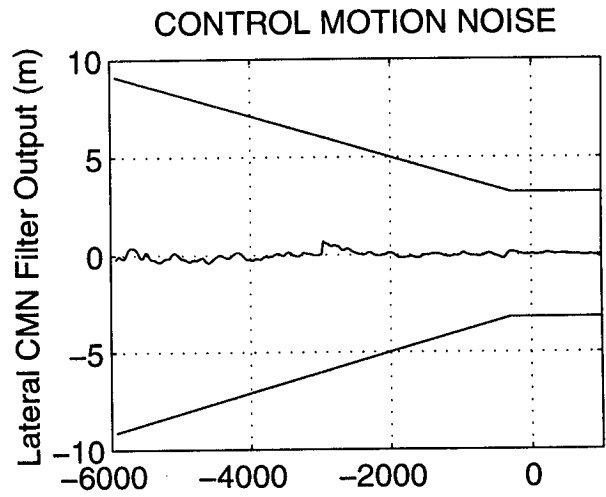
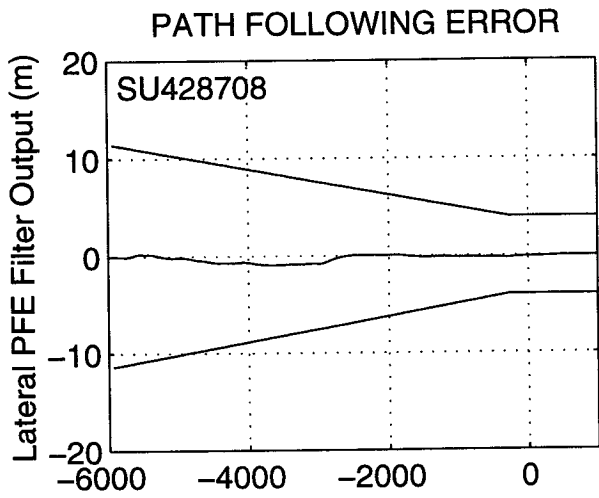
NRP Xrcs 2-RMS DIFFERENCE (m): 1.050
NRP Yrcs 2-RMS DIFFERENCE (m): 0.312
NRP Zrcs 2-RMS DIFFERENCE (m): 0.341

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

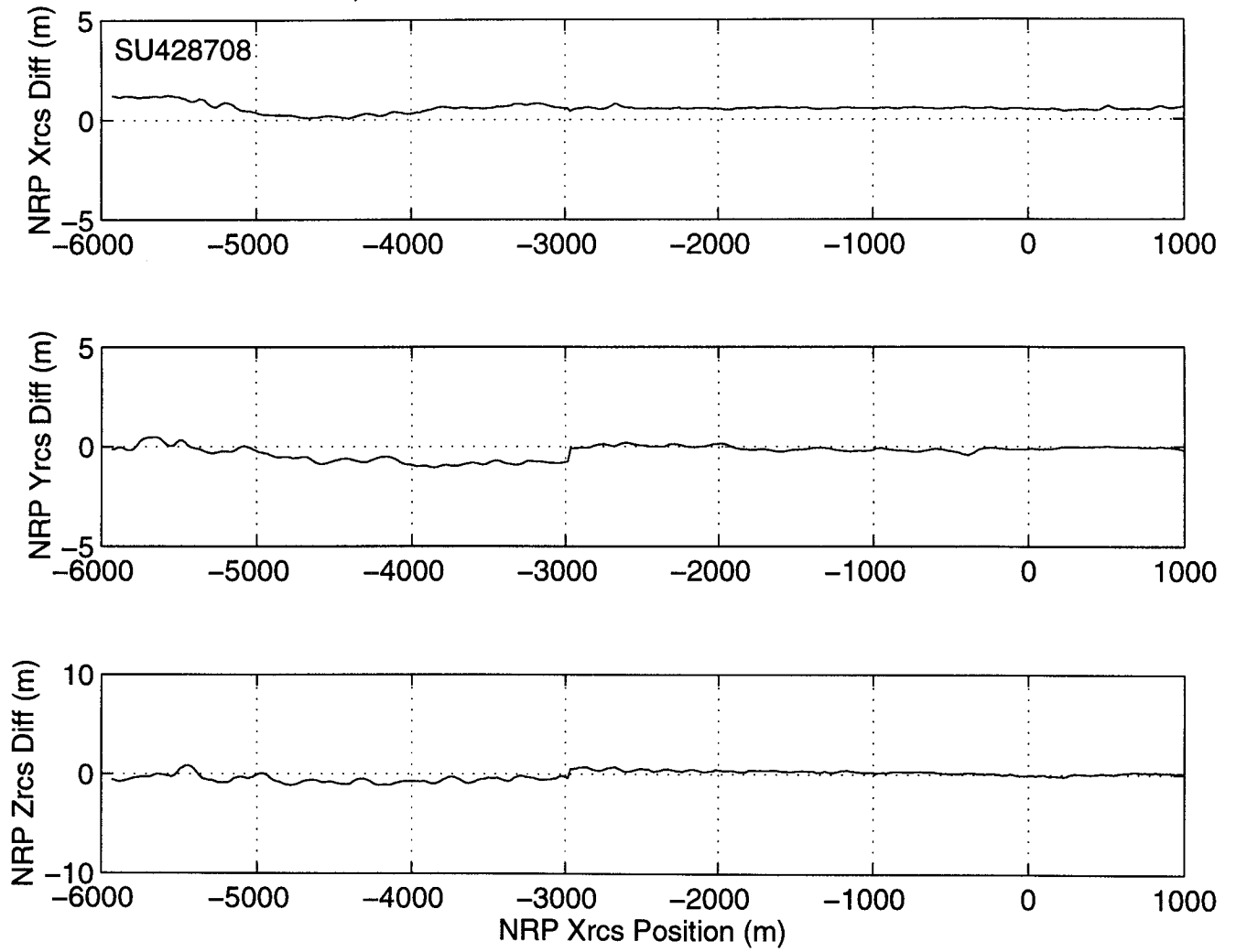
LGRP Xrcs POSITION (m): 136.857
LGRP Yrcs POSITION (m): -1.208







NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428710
START TIME: 496631.249
STOP TIME: 496729.249

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.5
MAXIMUM VDOP: 4.6
AVERAGE VDOP: 4.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.537
NRP Yrcs MEAN DIFFERENCE (m): -0.172
NRP Zrcs MEAN DIFFERENCE (m): 0.154

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.124
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.266
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.223

NRP Xrcs 2-RMS DIFFERENCE (m): 1.082
NRP Yrcs 2-RMS DIFFERENCE (m): 0.436
NRP Zrcs 2-RMS DIFFERENCE (m): 0.380

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.786
LGRP Yrcs POSITION (m): 0.973

APPROACH #: SU428710
START TIME: 496631.249
STOP TIME: 496729.249

MINIMUM HDOP: 2.4
MAXIMUM HDOP: 2.4
AVERAGE HDOP: 2.4

MINIMUM VDOP: 4.5
MAXIMUM VDOP: 4.6
AVERAGE VDOP: 4.6

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

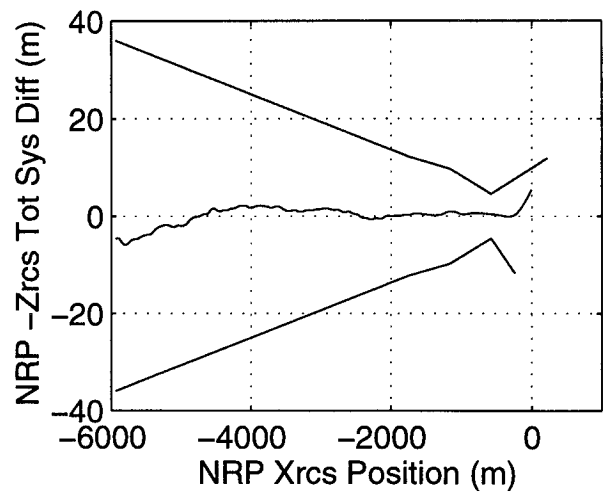
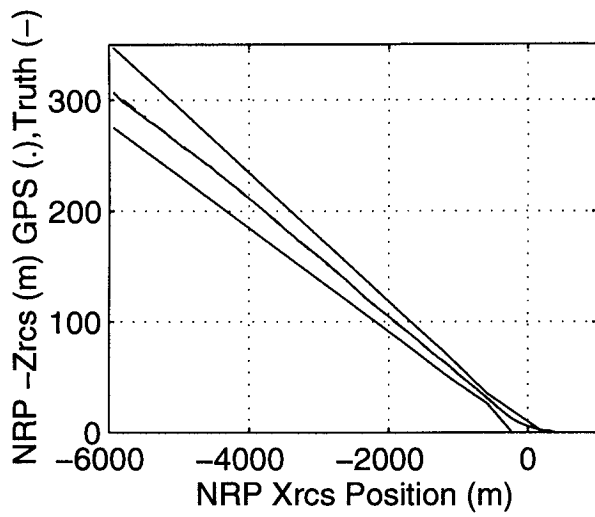
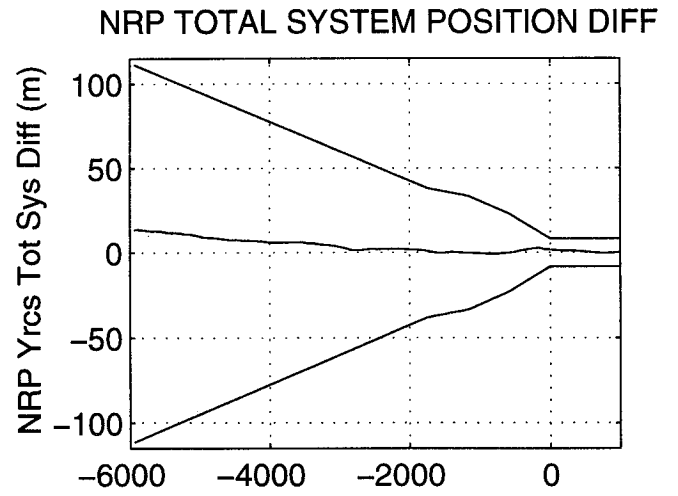
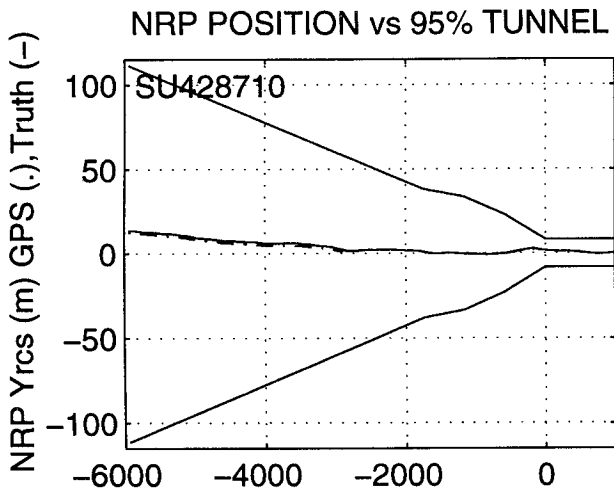
NRP Xrcs MEAN DIFFERENCE (m): 0.537
NRP Yrcs MEAN DIFFERENCE (m): -0.172
NRP Zrcs MEAN DIFFERENCE (m): 0.154

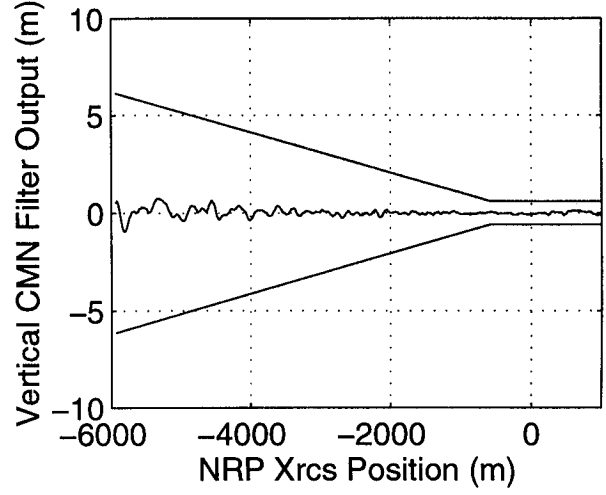
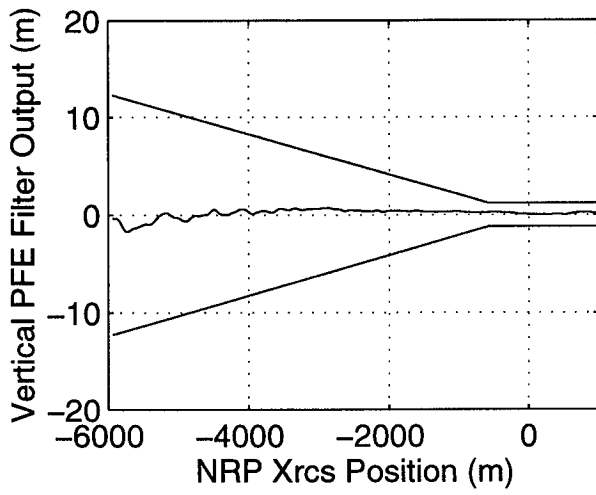
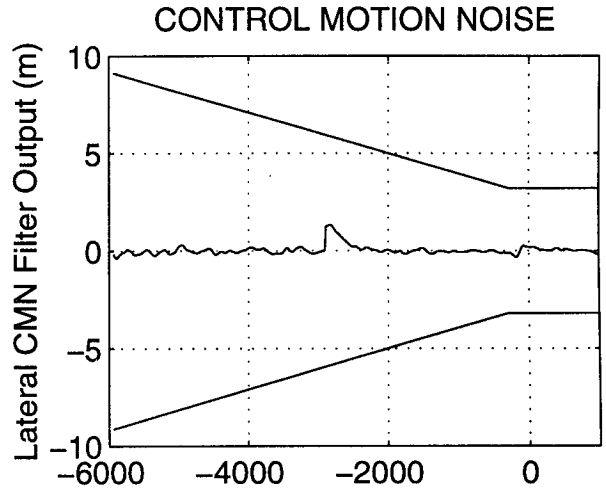
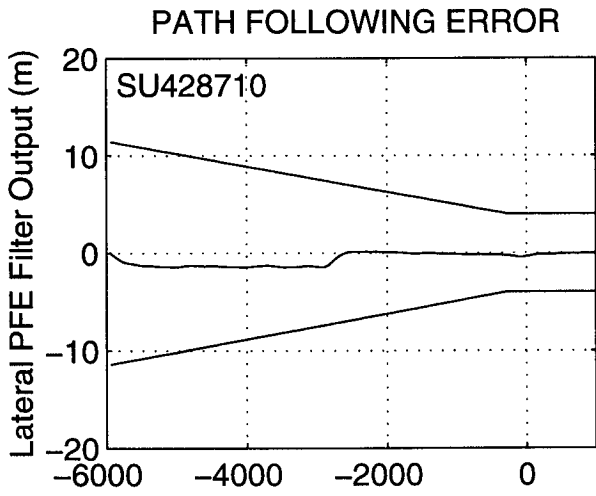
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.124
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.266
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.223

NRP Xrcs 2-RMS DIFFERENCE (m): 1.082
NRP Yrcs 2-RMS DIFFERENCE (m): 0.436
NRP Zrcs 2-RMS DIFFERENCE (m): 0.380

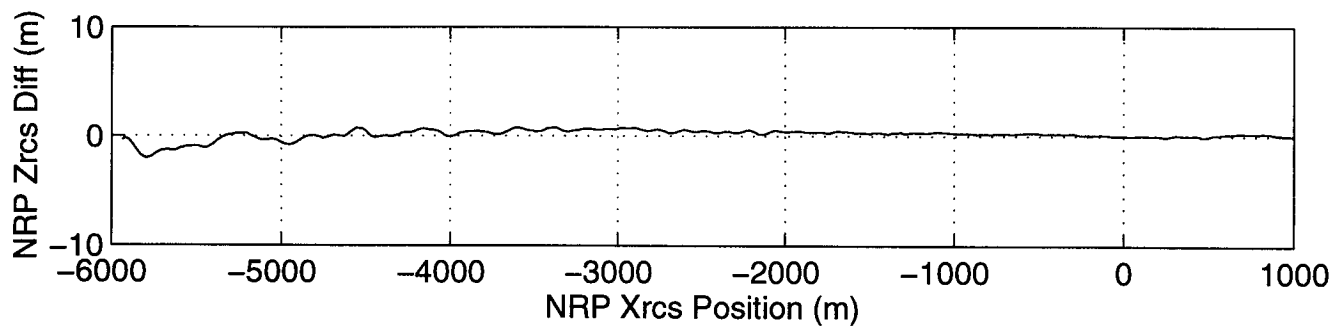
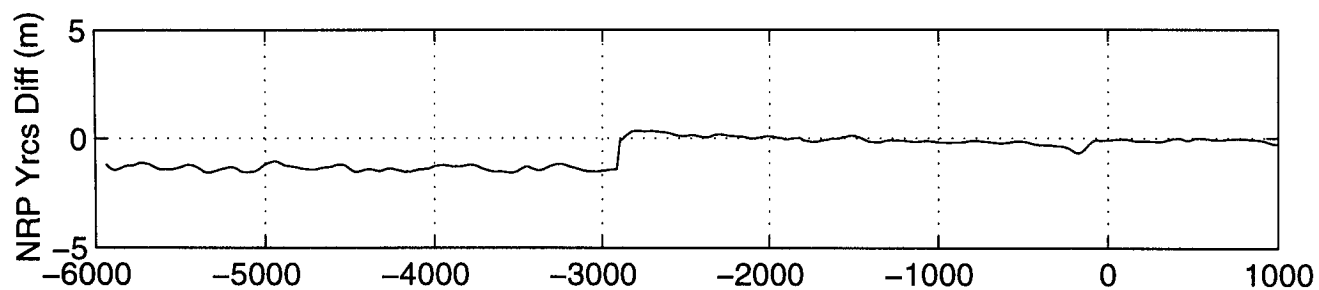
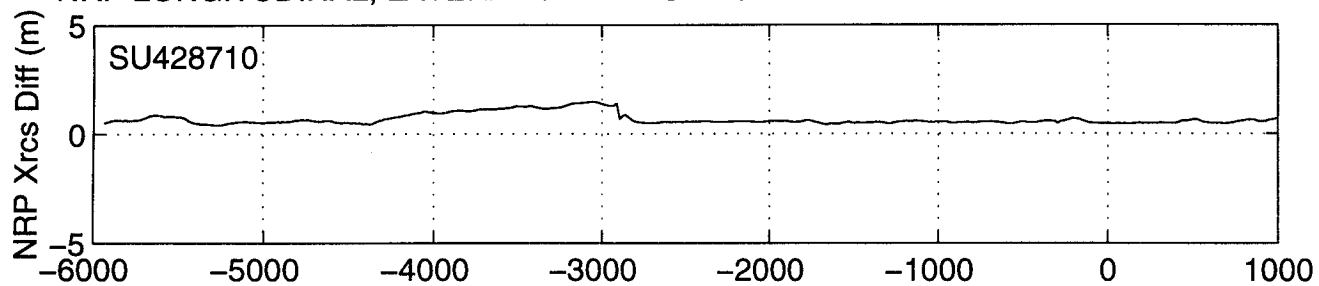
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.786
LGRP Yrcs POSITION (m): 0.973





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428712
START TIME: 497043.499
STOP TIME: 497140.749

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 4.9
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.460
NRP Yrcs MEAN DIFFERENCE (m): -0.197
NRP Zrcs MEAN DIFFERENCE (m): 0.111

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.164
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.302
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.230

NRP Xrcs 2-RMS DIFFERENCE (m): 0.934
NRP Yrcs 2-RMS DIFFERENCE (m): 0.497
NRP Zrcs 2-RMS DIFFERENCE (m): 0.319

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 182.509
LGRP Yrcs POSITION (m): 0.663

APPROACH #: SU428712
START TIME: 497043.499
STOP TIME: 497140.749

MINIMUM HDOP: 2.5
MAXIMUM HDOP: 2.5
AVERAGE HDOP: 2.5

MINIMUM VDOP: 4.8
MAXIMUM VDOP: 4.9
AVERAGE VDOP: 4.9

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

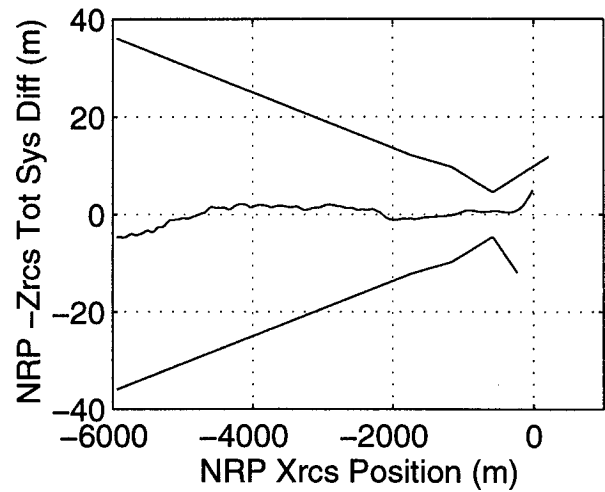
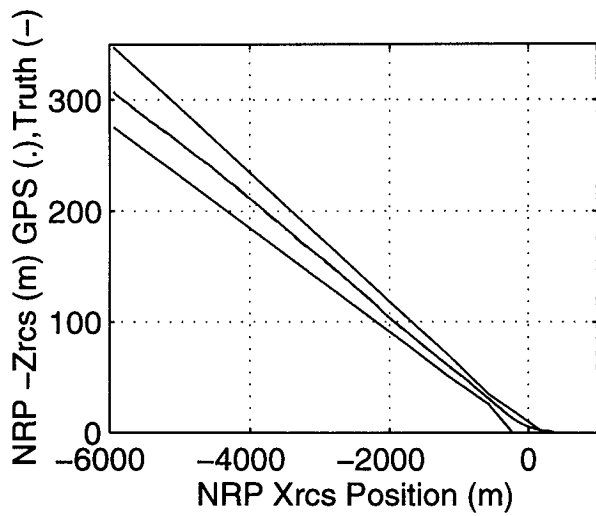
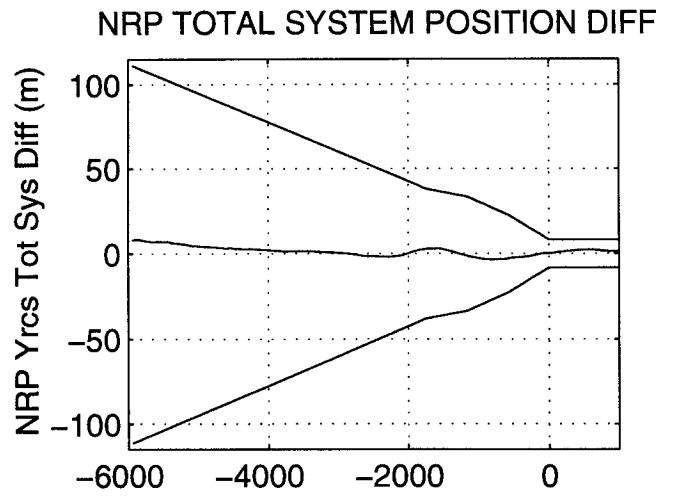
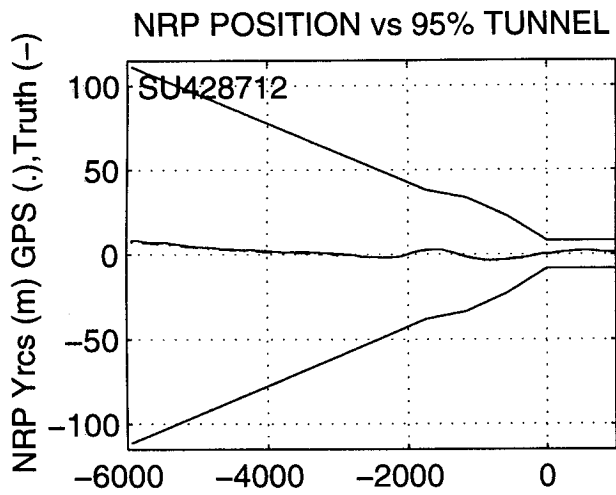
NRP Xrcs MEAN DIFFERENCE (m): 0.460
NRP Yrcs MEAN DIFFERENCE (m): -0.197
NRP Zrcs MEAN DIFFERENCE (m): 0.111

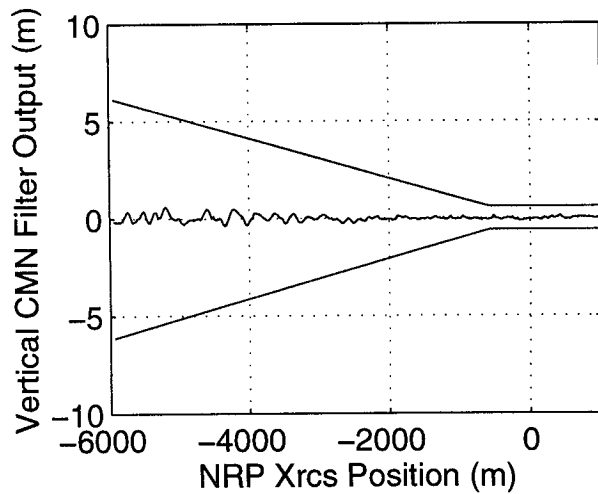
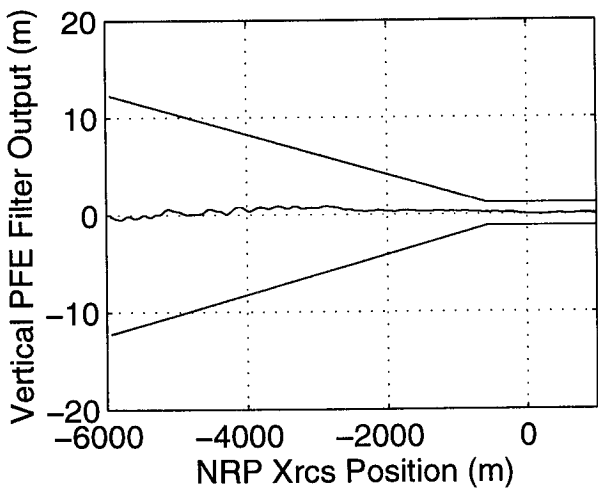
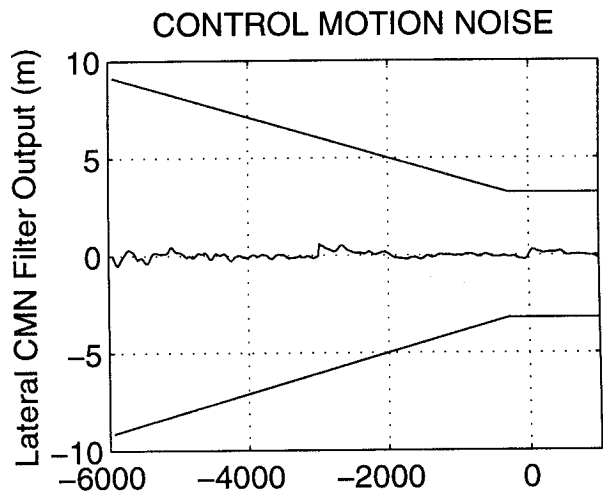
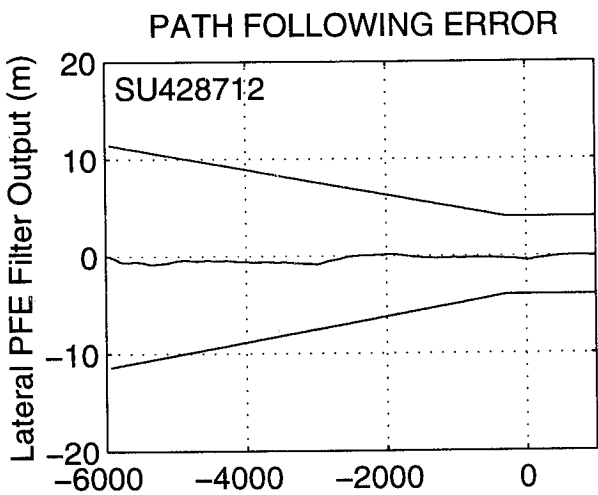
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.164
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.302
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.230

NRP Xrcs 2-RMS DIFFERENCE (m): 0.934
NRP Yrcs 2-RMS DIFFERENCE (m): 0.497
NRP Zrcs 2-RMS DIFFERENCE (m): 0.319

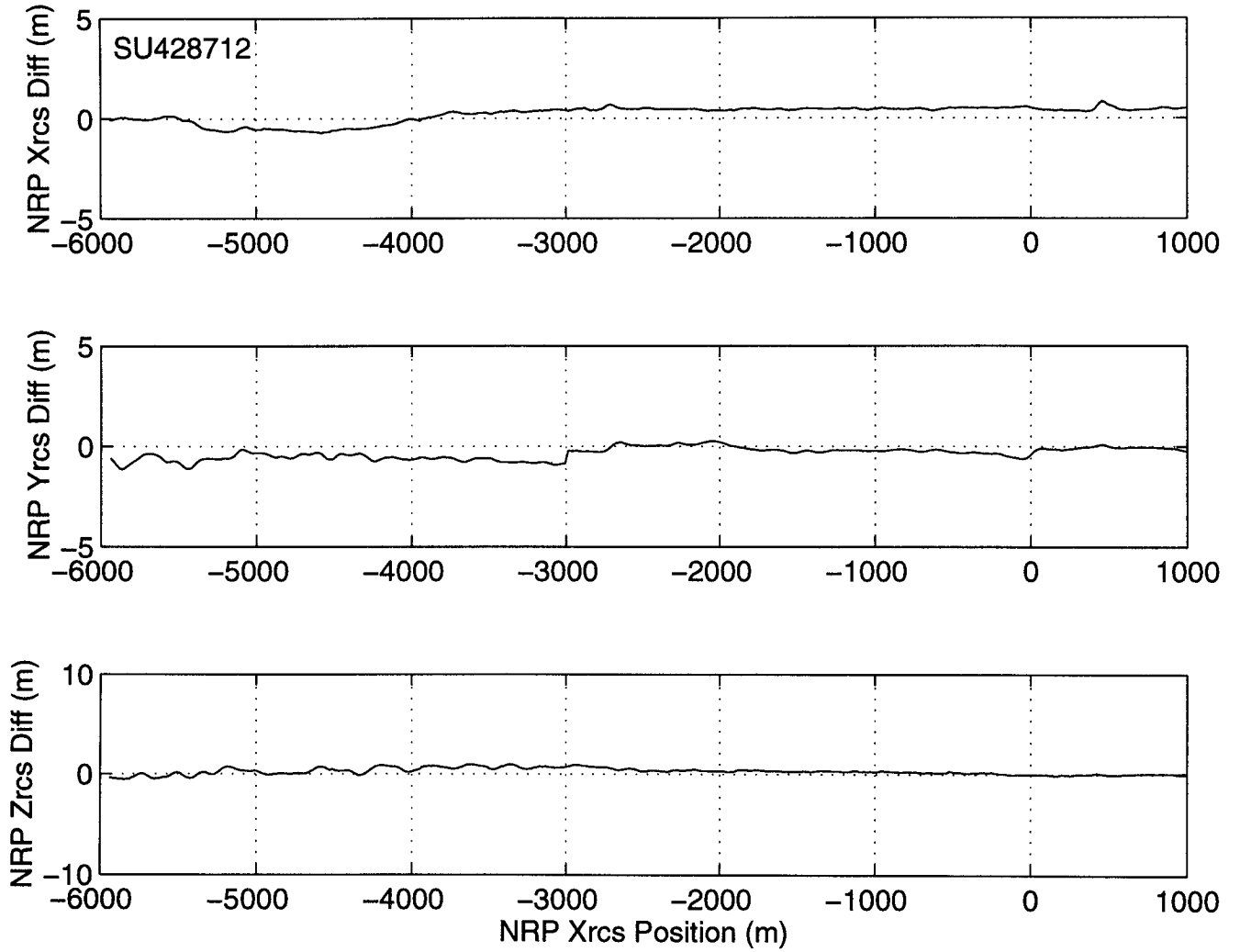
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 182.509
LGRP Yrcs POSITION (m): 0.663





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428714
START TIME: 497492.749
STOP TIME: 497593.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.666
NRP Yrcs MEAN DIFFERENCE (m): -0.131
NRP Zrcs MEAN DIFFERENCE (m): 0.118

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.363
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.201
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.245

NRP Xrcs 2-RMS DIFFERENCE (m): 1.380
NRP Yrcs 2-RMS DIFFERENCE (m): 0.331
NRP Zrcs 2-RMS DIFFERENCE (m): 0.340

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 117.852
LGRP Yrcs POSITION (m): -0.045

APPROACH #: SU428714
START TIME: 497492.749
STOP TIME: 497593.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

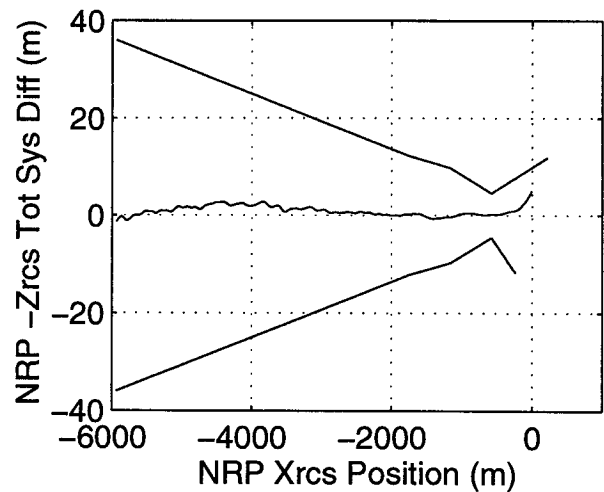
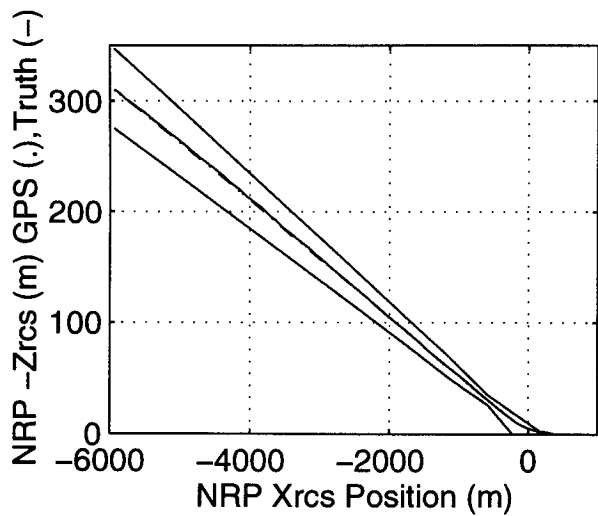
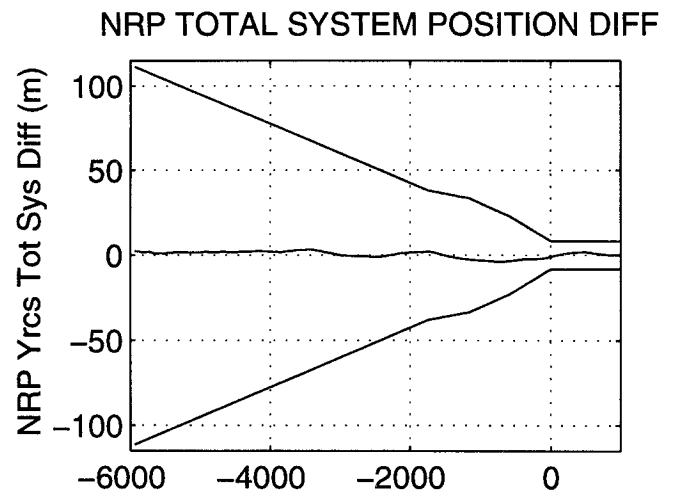
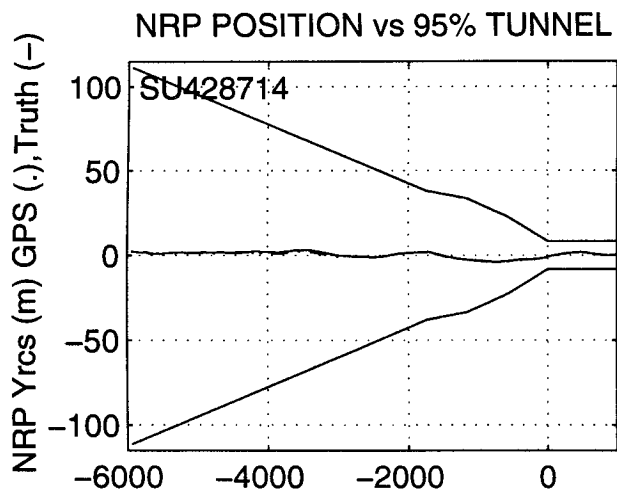
NRP Xrcs MEAN DIFFERENCE (m): 0.666
NRP Yrcs MEAN DIFFERENCE (m): -0.131
NRP Zrcs MEAN DIFFERENCE (m): 0.118

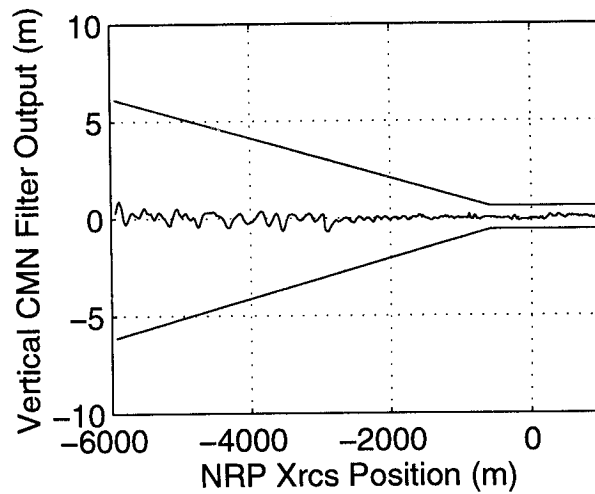
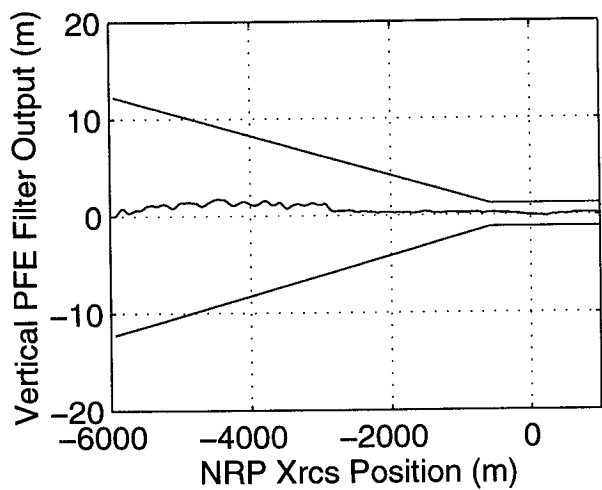
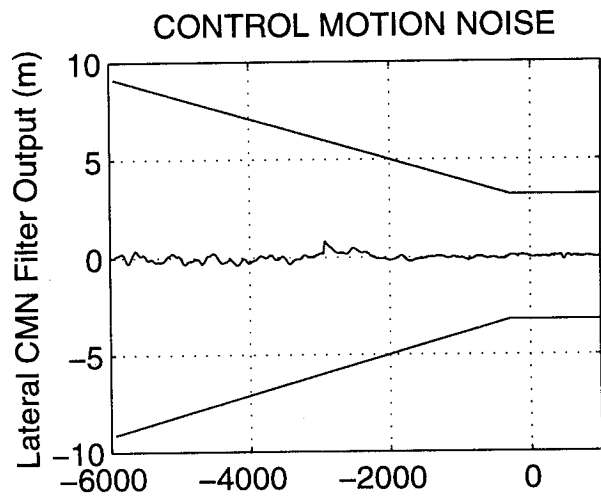
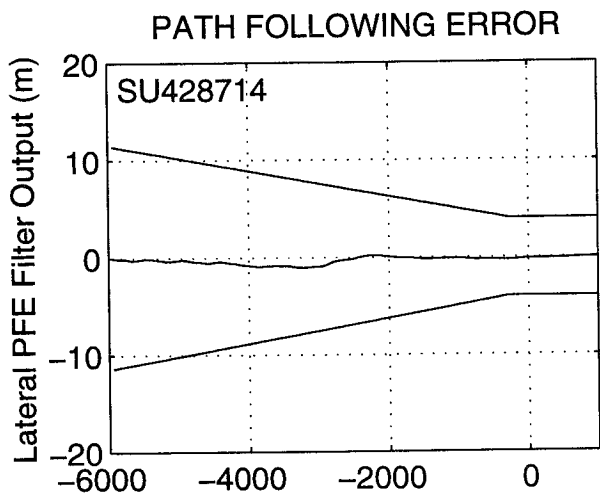
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.363
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.201
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.245

NRP Xrcs 2-RMS DIFFERENCE (m): 1.380
NRP Yrcs 2-RMS DIFFERENCE (m): 0.331
NRP Zrcs 2-RMS DIFFERENCE (m): 0.340

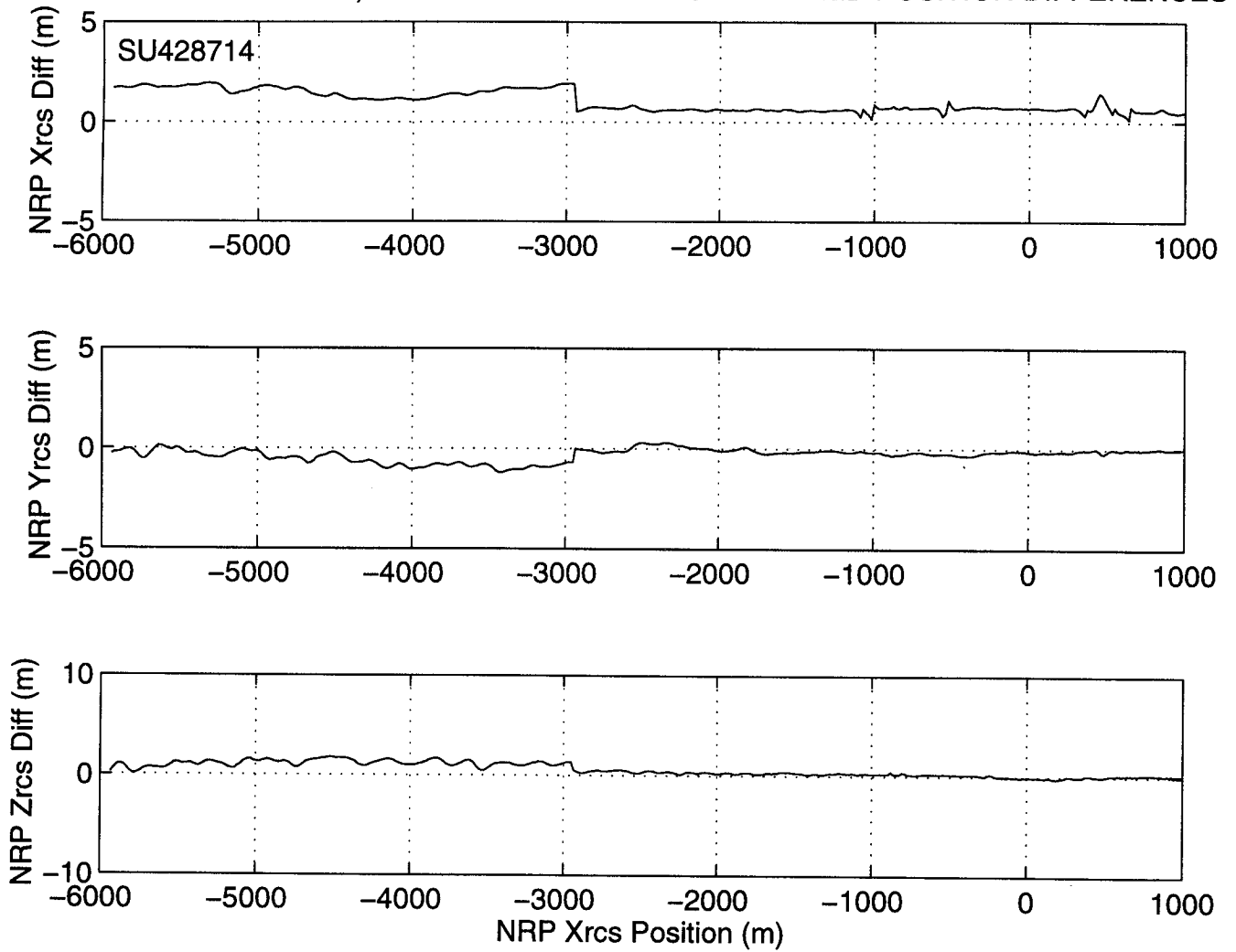
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 117.852
LGRP Yrcs POSITION (m): -0.045





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428720
START TIME: 499610.499
STOP TIME: 499709.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.660
NRP Yrcs MEAN DIFFERENCE (m): -0.239
NRP Zrcs MEAN DIFFERENCE (m): 0.169

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.245
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.353
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.287

NRP Xrcs 2-RMS DIFFERENCE (m): 1.342
NRP Yrcs 2-RMS DIFFERENCE (m): 0.595
NRP Zrcs 2-RMS DIFFERENCE (m): 0.443

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 154.243
LGRP Yrcs POSITION (m): 0.252

APPROACH #: SU428720
START TIME: 499610.499
STOP TIME: 499709.499

MINIMUM HDOP: 2.7
MAXIMUM HDOP: 2.7
AVERAGE HDOP: 2.7

MINIMUM VDOP: 5.3
MAXIMUM VDOP: 5.3
AVERAGE VDOP: 5.3

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

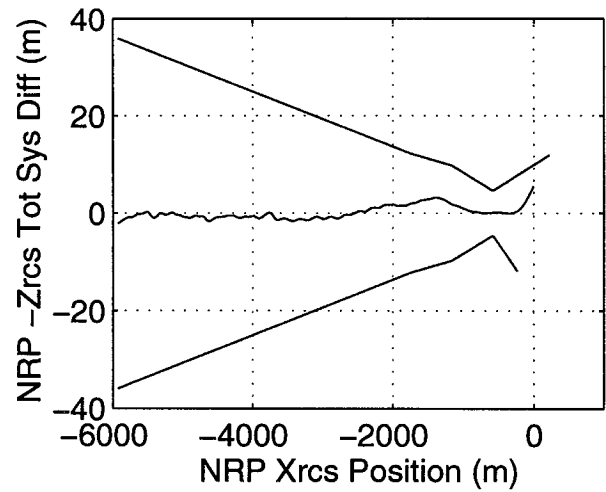
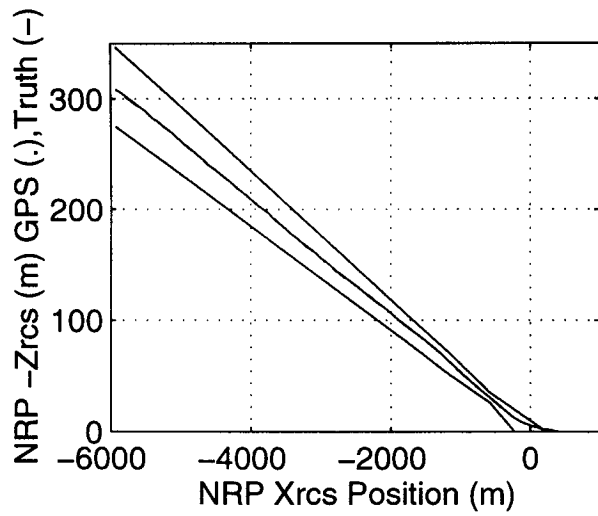
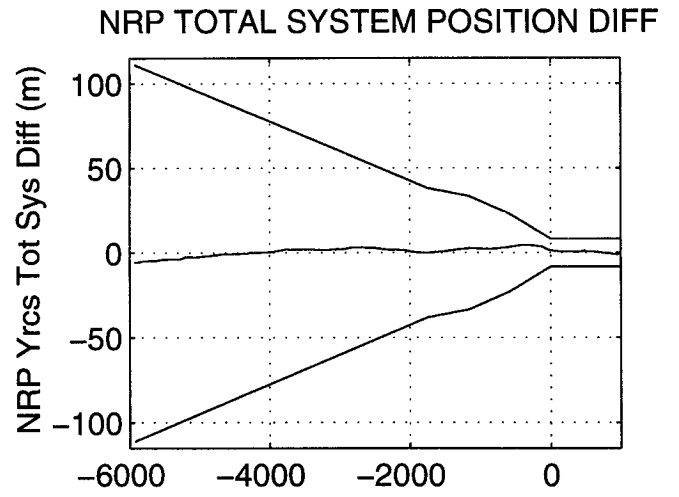
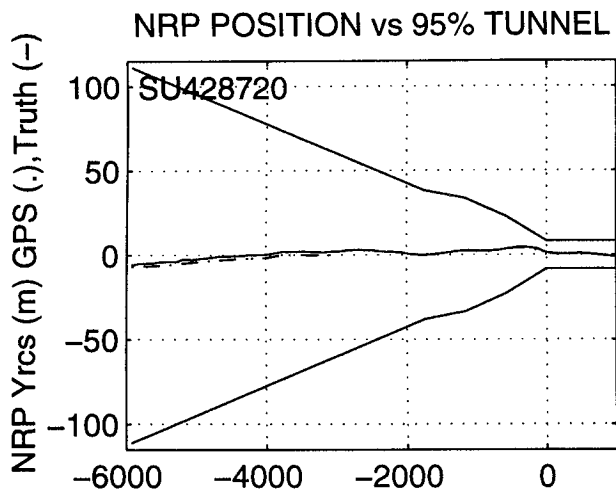
NRP Xrcs MEAN DIFFERENCE (m): 0.660
NRP Yrcs MEAN DIFFERENCE (m): -0.239
NRP Zrcs MEAN DIFFERENCE (m): 0.169

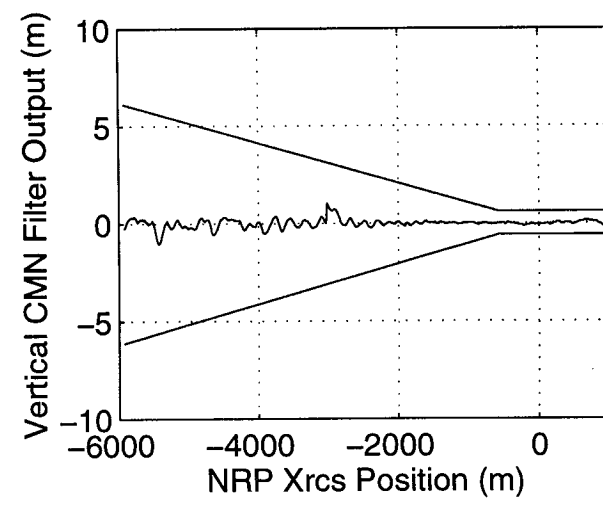
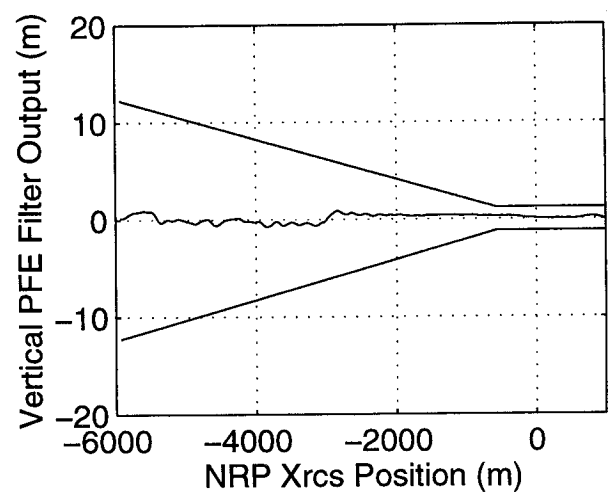
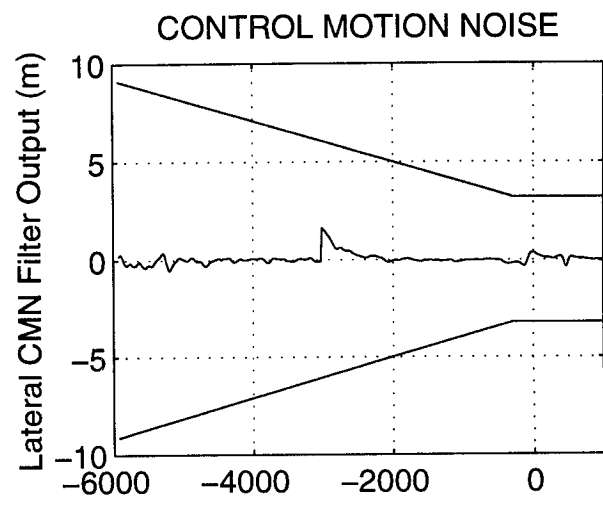
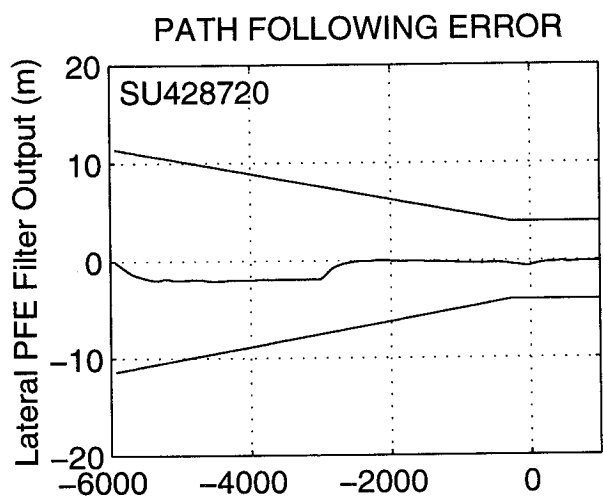
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.245
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.353
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.287

NRP Xrcs 2-RMS DIFFERENCE (m): 1.342
NRP Yrcs 2-RMS DIFFERENCE (m): 0.595
NRP Zrcs 2-RMS DIFFERENCE (m): 0.443

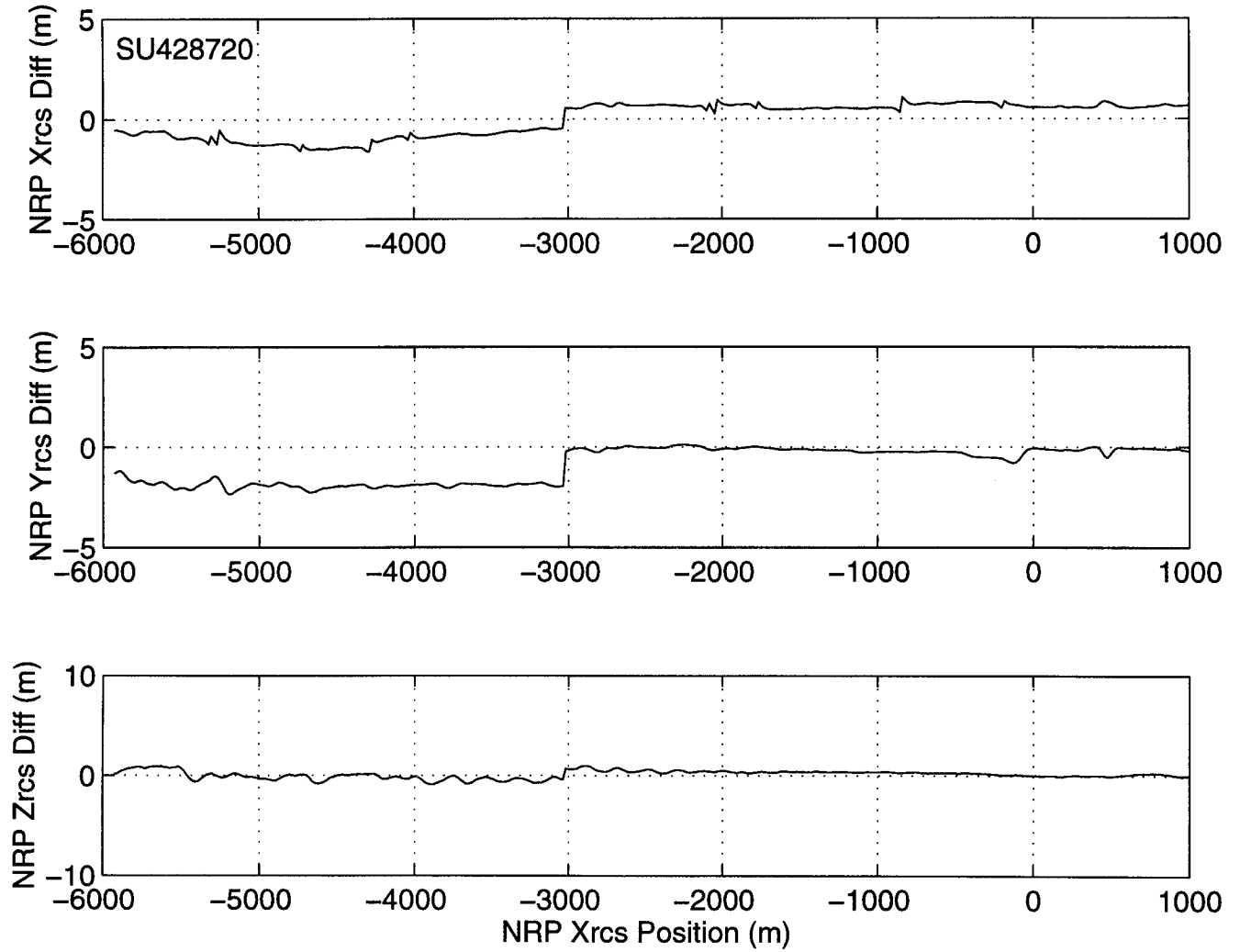
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 154.243
LGRP Yrcs POSITION (m): 0.252





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428722
START TIME: 500032.999
STOP TIME: 500131.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.4
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.575
NRP Yrcs MEAN DIFFERENCE (m): -0.269
NRP Zrcs MEAN DIFFERENCE (m): 0.052

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.197
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.366
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.280

NRP Xrcs 2-RMS DIFFERENCE (m): 1.167
NRP Yrcs 2-RMS DIFFERENCE (m): 0.651
NRP Zrcs 2-RMS DIFFERENCE (m): 0.299

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 140.551
LGRP Yrcs POSITION (m): -1.153

APPROACH #: SU428722
START TIME: 500032.999
STOP TIME: 500131.749

MINIMUM HDOP: 2.8
MAXIMUM HDOP: 2.8
AVERAGE HDOP: 2.8

MINIMUM VDOP: 5.4
MAXIMUM VDOP: 5.4
AVERAGE VDOP: 5.4

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

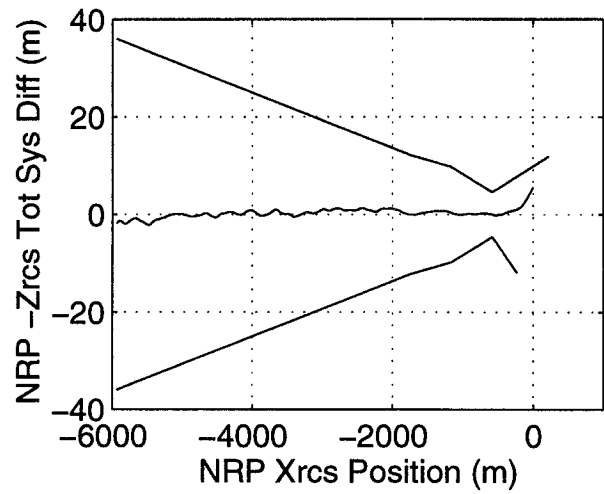
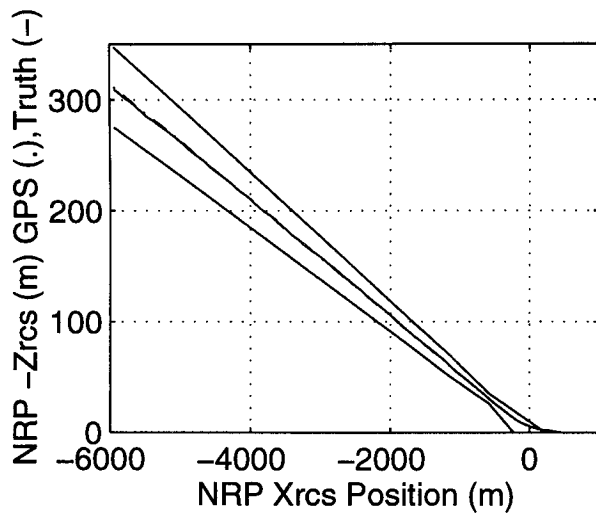
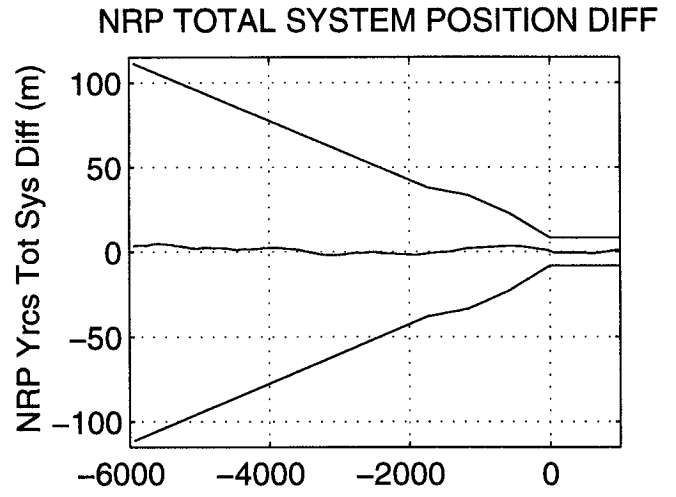
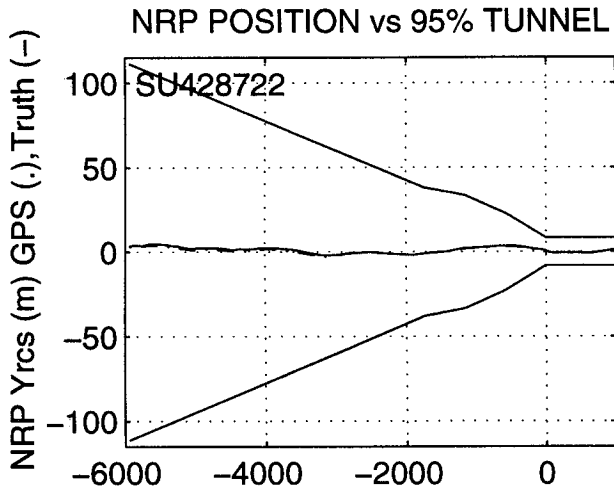
NRP Xrcs MEAN DIFFERENCE (m): 0.575
NRP Yrcs MEAN DIFFERENCE (m): -0.269
NRP Zrcs MEAN DIFFERENCE (m): 0.052

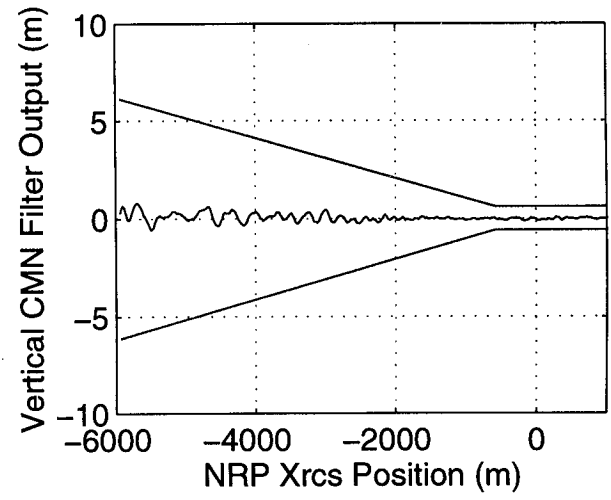
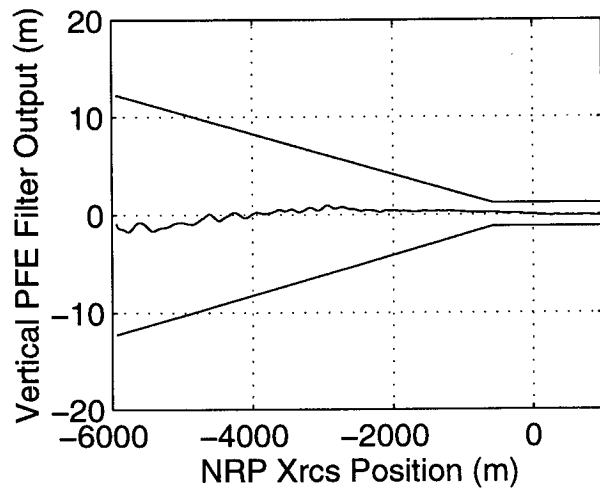
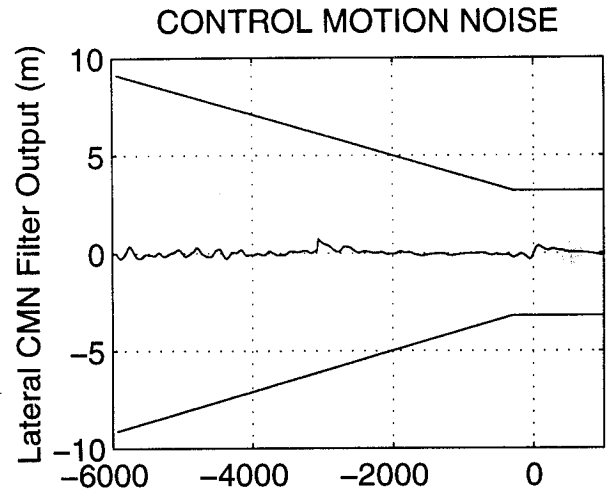
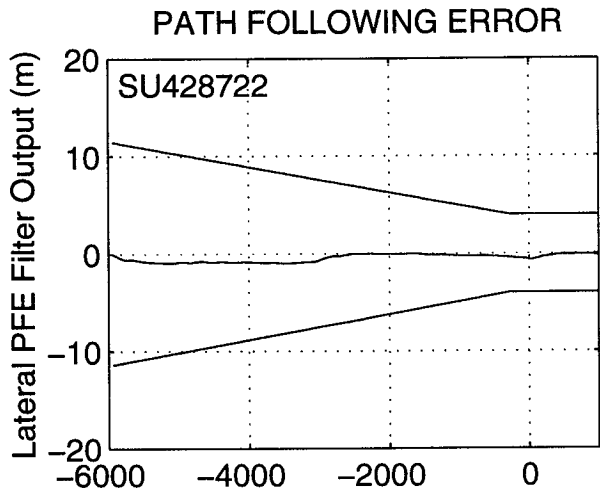
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.197
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.366
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.280

NRP Xrcs 2-RMS DIFFERENCE (m): 1.167
NRP Yrcs 2-RMS DIFFERENCE (m): 0.651
NRP Zrcs 2-RMS DIFFERENCE (m): 0.299

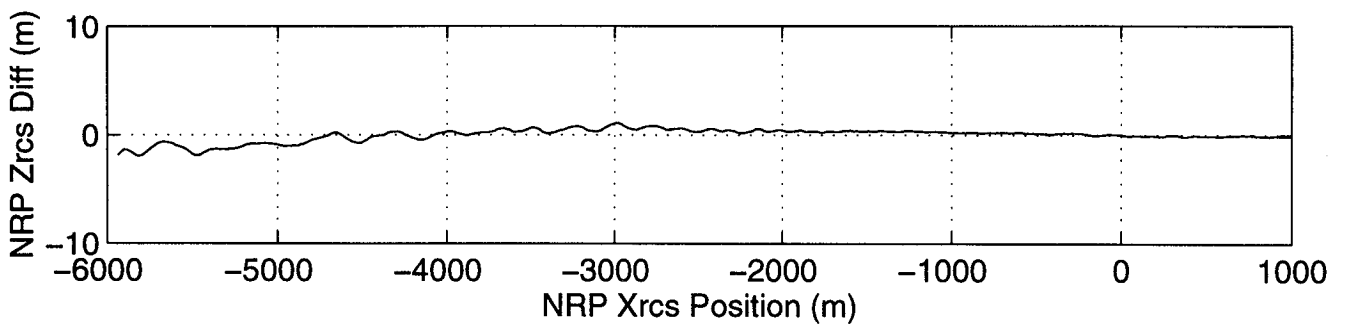
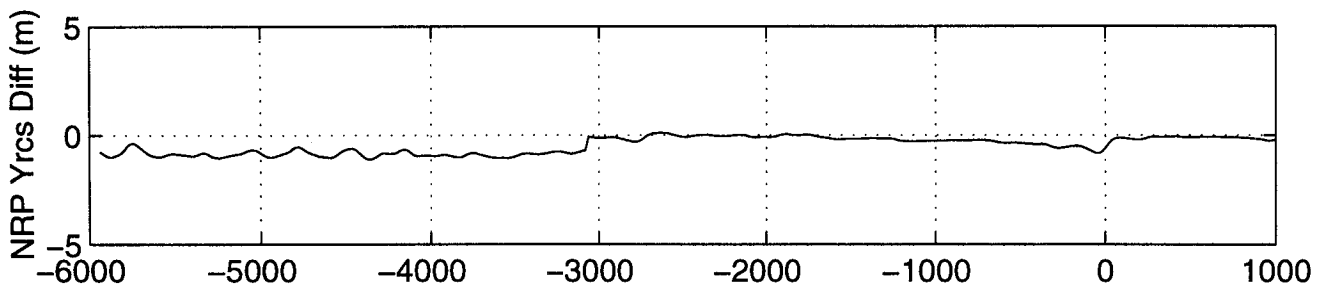
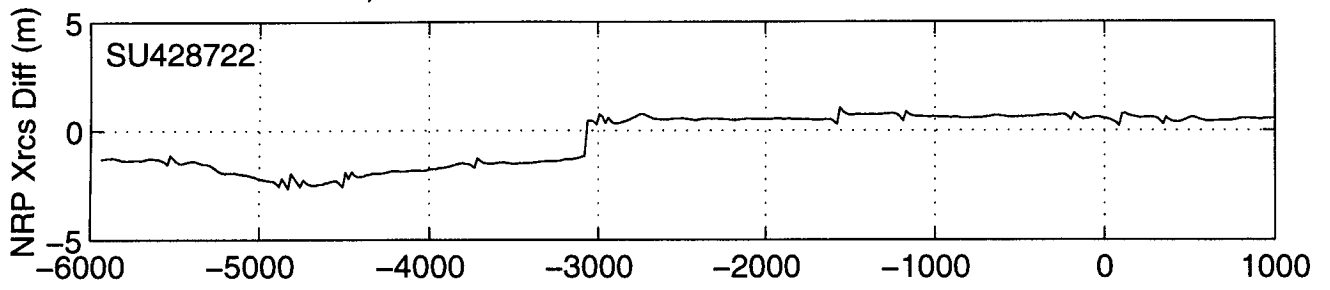
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 140.551
LGRP Yrcs POSITION (m): -1.153





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428724
START TIME: 500462.999
STOP TIME: 500563.249

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.709
NRP Yrcs MEAN DIFFERENCE (m): -0.167
NRP Zrcs MEAN DIFFERENCE (m): 0.118

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.369
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.256
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.260

NRP Xrcs 2-RMS DIFFERENCE (m): 1.466
NRP Yrcs 2-RMS DIFFERENCE (m): 0.421
NRP Zrcs 2-RMS DIFFERENCE (m): 0.351

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.991
LGRP Yrcs POSITION (m): -1.268

APPROACH #: SU428724
START TIME: 500462.999
STOP TIME: 500563.249

MINIMUM HDOP: 2.9
MAXIMUM HDOP: 2.9
AVERAGE HDOP: 2.9

MINIMUM VDOP: 5.5
MAXIMUM VDOP: 5.5
AVERAGE VDOP: 5.5

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

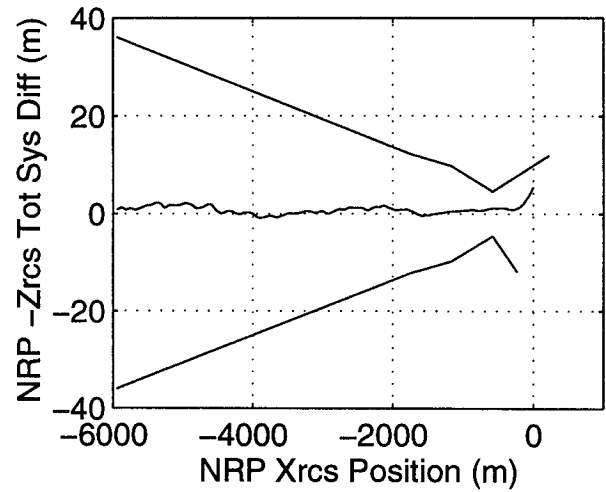
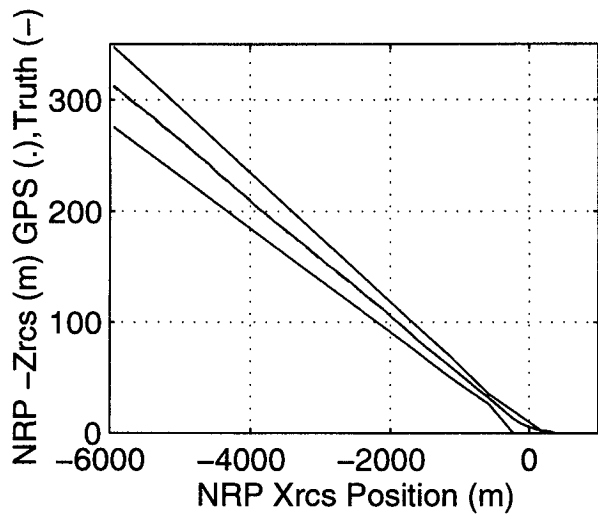
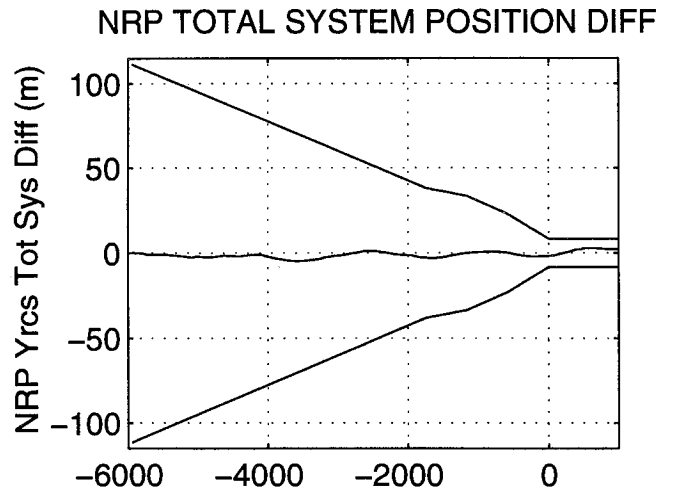
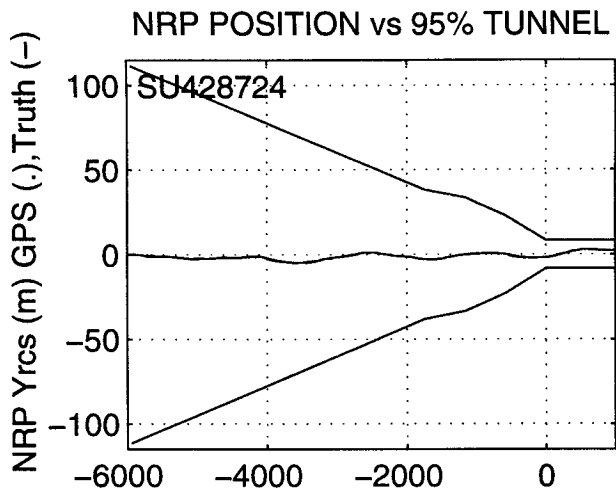
NRP Xrcs MEAN DIFFERENCE (m): 0.709
NRP Yrcs MEAN DIFFERENCE (m): -0.167
NRP Zrcs MEAN DIFFERENCE (m): 0.118

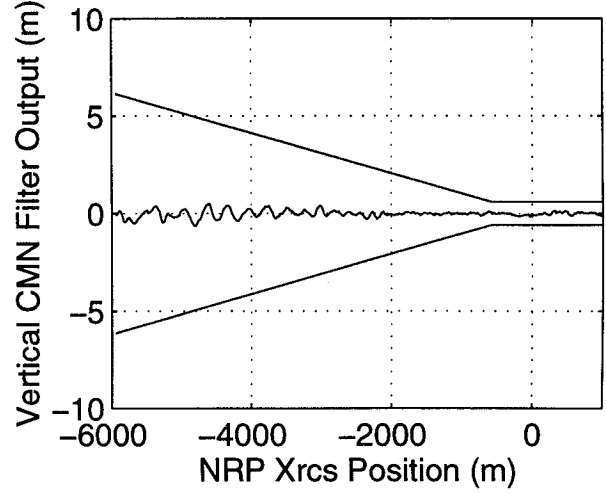
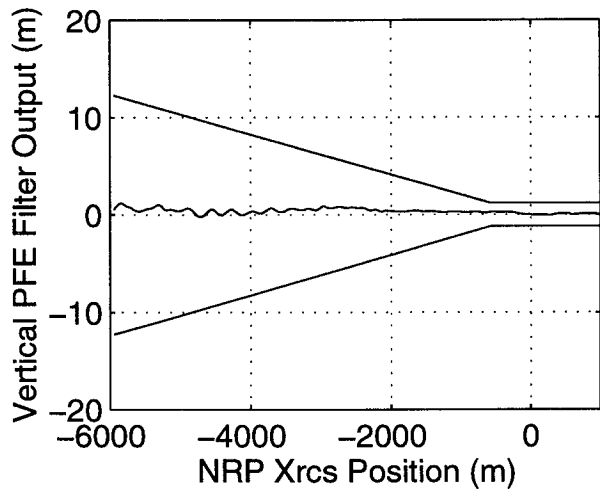
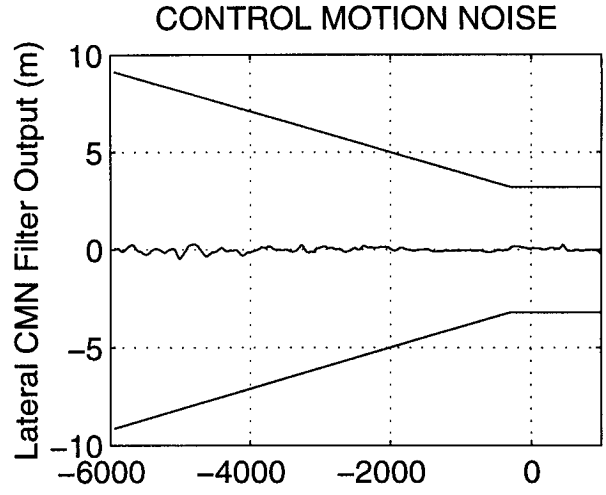
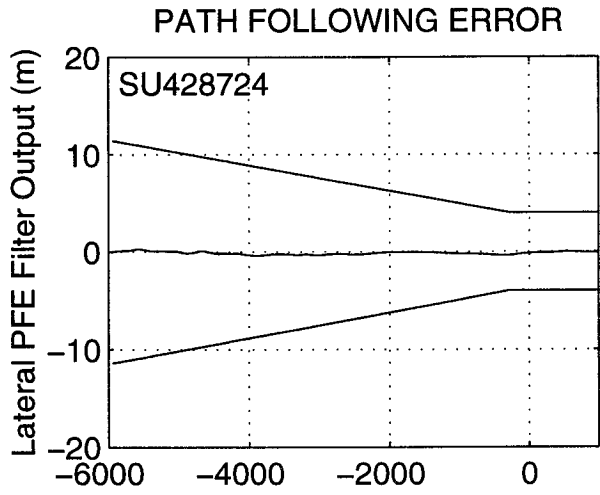
NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.369
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.256
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.260

NRP Xrcs 2-RMS DIFFERENCE (m): 1.466
NRP Yrcs 2-RMS DIFFERENCE (m): 0.421
NRP Zrcs 2-RMS DIFFERENCE (m): 0.351

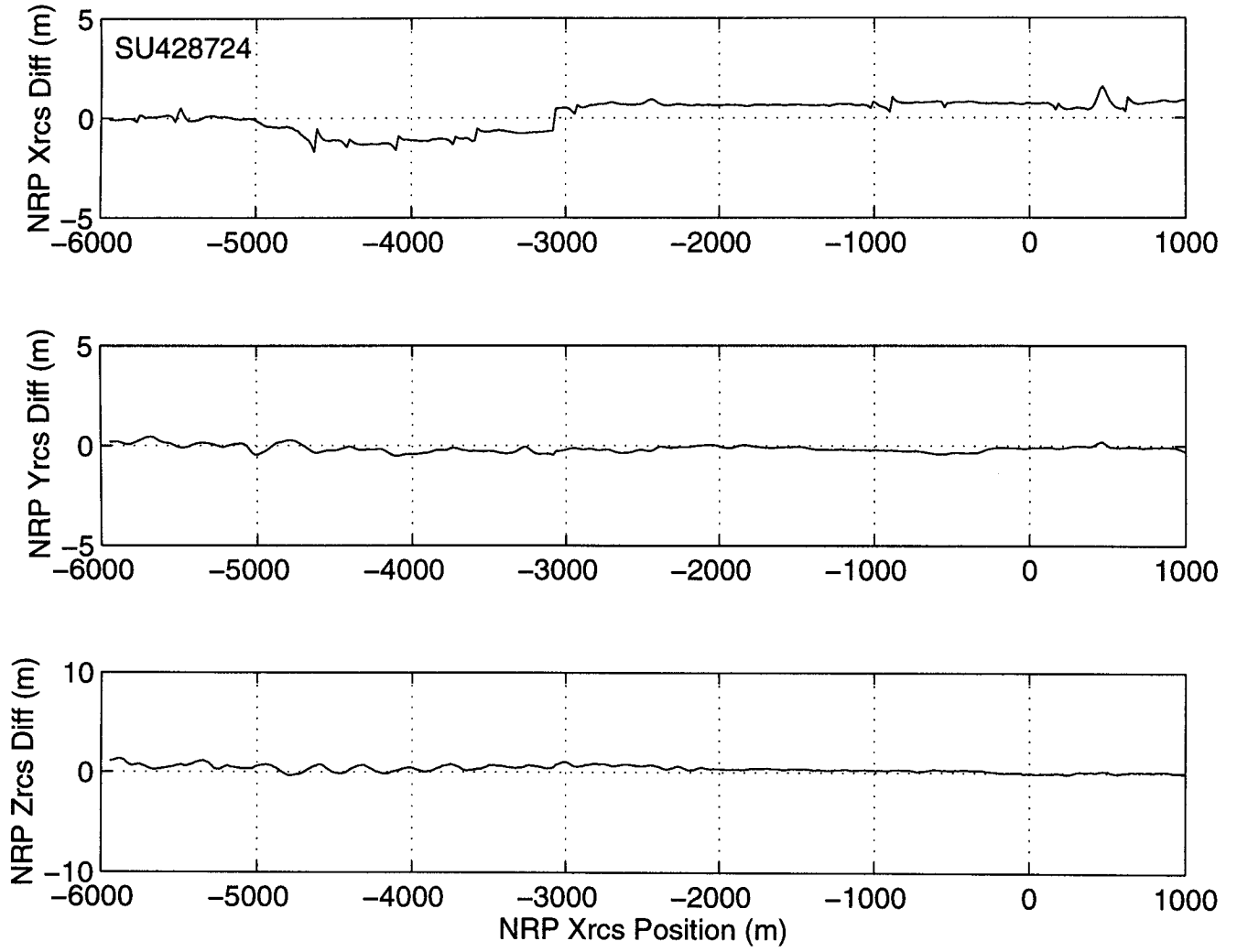
LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 153.991
LGRP Yrcs POSITION (m): -1.268





NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428730
START TIME: 501793.749
STOP TIME: 501896.999

MINIMUM HDOP: 3.5
MAXIMUM HDOP: 3.6
AVERAGE HDOP: 3.6

MINIMUM VDOP: 6.7
MAXIMUM VDOP: 6.9
AVERAGE VDOP: 6.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.589
NRP Yrcs MEAN DIFFERENCE (m): -0.164
NRP Zrcs MEAN DIFFERENCE (m): 0.089

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.242
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.378
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.275

NRP Xrcs 2-RMS DIFFERENCE (m): 1.202
NRP Yrcs 2-RMS DIFFERENCE (m): 0.501
NRP Zrcs 2-RMS DIFFERENCE (m): 0.328

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 128.892
LGRP Yrcs POSITION (m): -0.268

APPROACH #: SU428730
START TIME: 501793.749
STOP TIME: 501896.999

MINIMUM HDOP: 3.5
MAXIMUM HDOP: 3.6
AVERAGE HDOP: 3.6

MINIMUM VDOP: 6.7
MAXIMUM VDOP: 6.9
AVERAGE VDOP: 6.8

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* UNSUCCESSFUL APPROACH (MOS 1) DUE TO LESS THAN *
* 95 PERCENT OF ALL OF THE DATA POINTS WITHIN *
* THE VERTICAL FILTER REQUIREMENTS *

* VALID APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

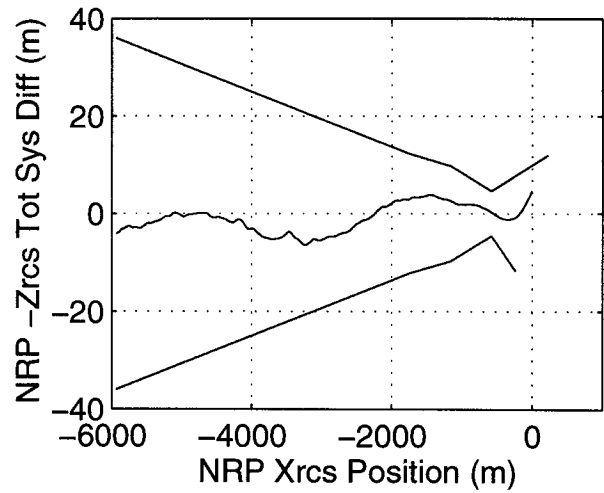
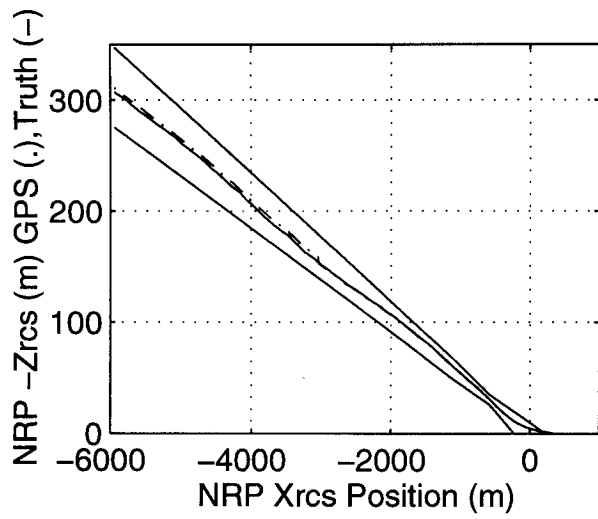
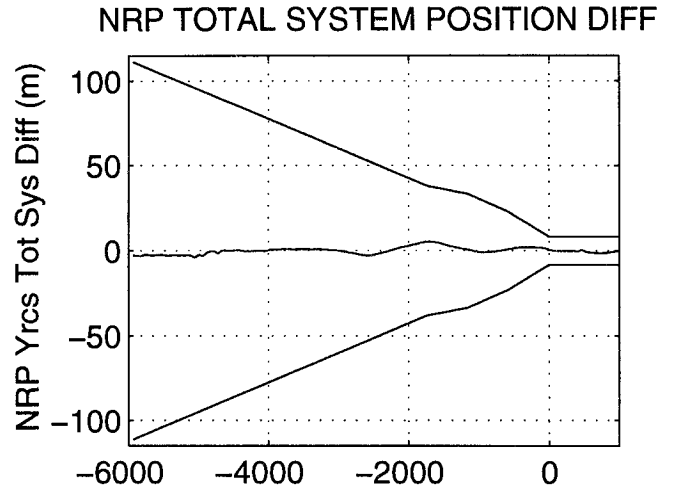
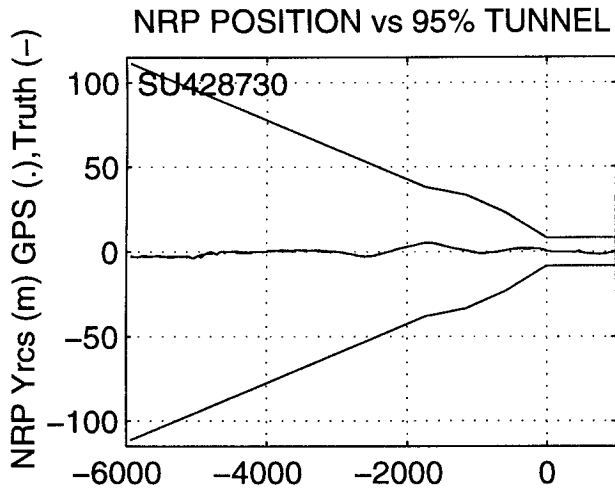
NRP Xrcs MEAN DIFFERENCE (m): 0.589
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NRP Zrcs MEAN DIFFERENCE (m): 0.089

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.242
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NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.275

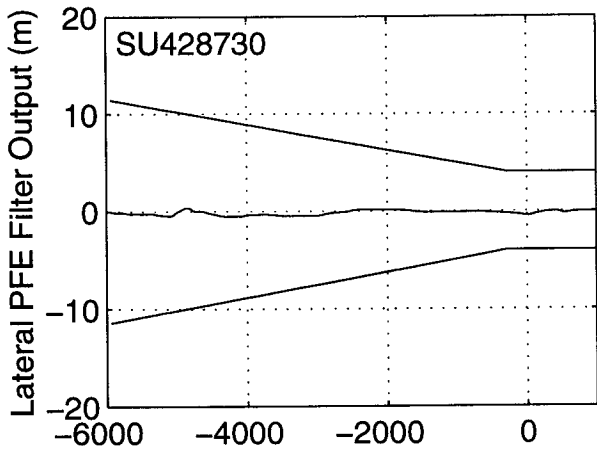
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NRP Yrcs 2-RMS DIFFERENCE (m): 0.501
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LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

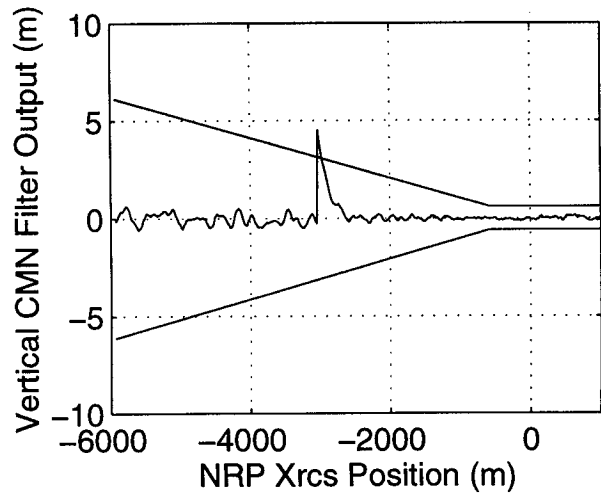
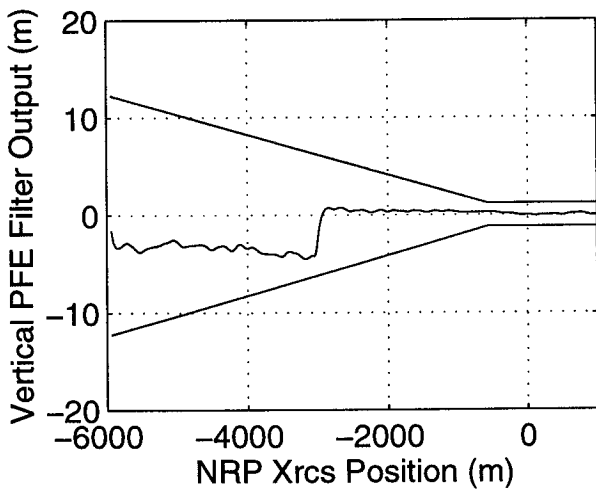
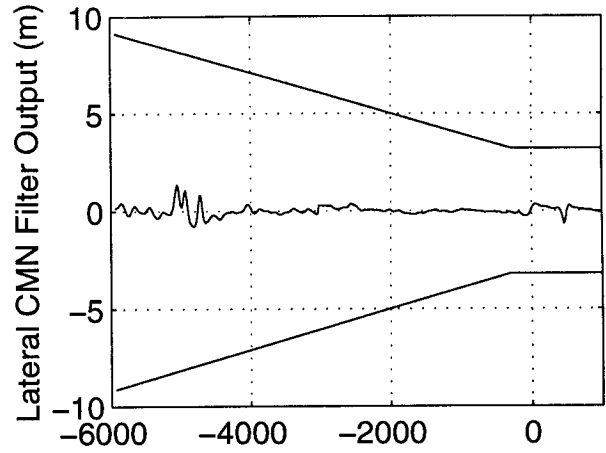
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LGRP Yrcs POSITION (m): -0.268



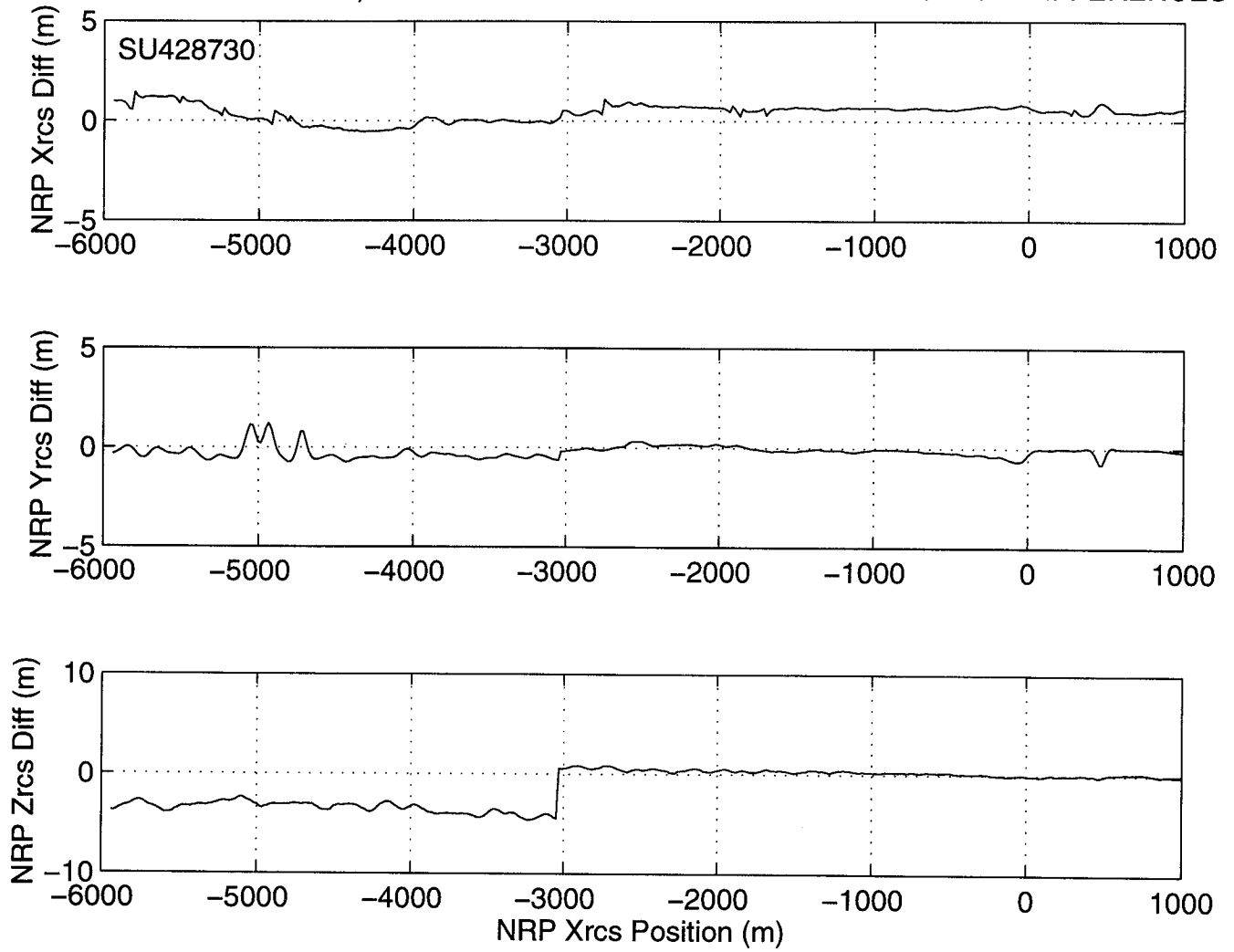
PATH FOLLOWING ERROR



CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



APPROACH #: SU428734
START TIME: 502642.499
STOP TIME: 502746.499

MINIMUM HDOP: 4.0
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 4.0

MINIMUM VDOP: 8.8
MAXIMUM VDOP: 9.1
AVERAGE VDOP: 9.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: TOTAL SYSTEM ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

NRP Xrcs MEAN DIFFERENCE (m): 0.659
NRP Yrcs MEAN DIFFERENCE (m): -0.087
NRP Zrcs MEAN DIFFERENCE (m): 0.172

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.391
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.197
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.288

NRP Xrcs 2-RMS DIFFERENCE (m): 1.375
NRP Yrcs 2-RMS DIFFERENCE (m): 0.263
NRP Zrcs 2-RMS DIFFERENCE (m): 0.449

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

LGRP Xrcs POSITION (m): 99.080
LGRP Yrcs POSITION (m): 0.007

APPROACH #: SU428734
START TIME: 502642.499
STOP TIME: 502746.499

MINIMUM HDOP: 4.0
MAXIMUM HDOP: 4.0
AVERAGE HDOP: 4.0

MINIMUM VDOP: 8.8
MAXIMUM VDOP: 9.1
AVERAGE VDOP: 9.0

MINIMUM NUMBER OF SVs: 4
MAXIMUM NUMBER OF SVs: 4
AVERAGE NUMBER OF SVs: 4

* METHOD OF EVALUATION: SENSOR ACCURACY *

* VALID APPROACH *

* SUCCESSFUL APPROACH *

TIME HISTORY ANALYSIS FROM 200 ft HAT -> ROLL-OUT

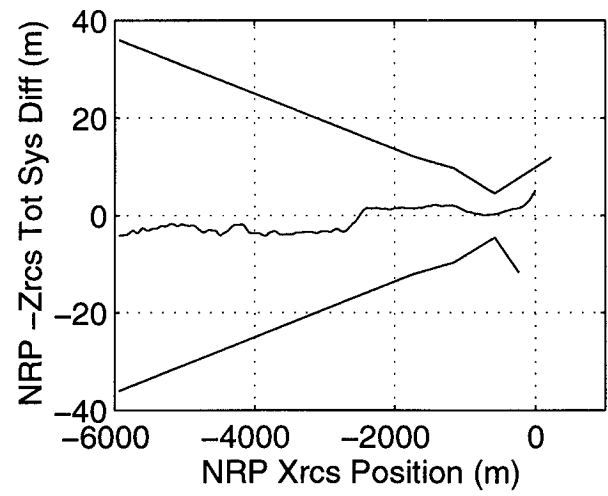
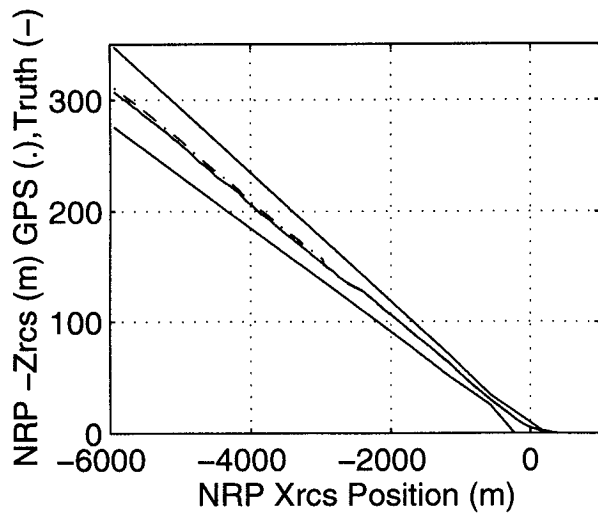
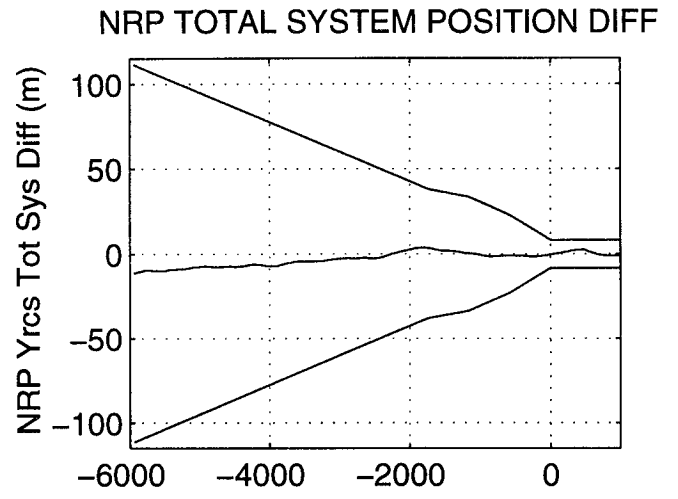
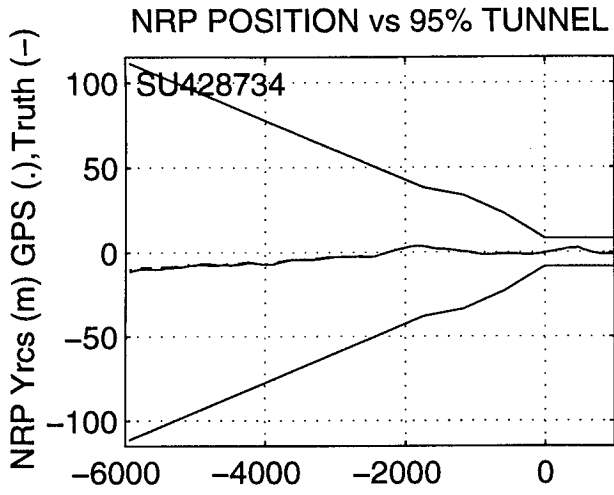
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NRP Yrcs MEAN DIFFERENCE (m): -0.087
NRP Zrcs MEAN DIFFERENCE (m): 0.172

NRP Xrcs 2-SIGMA DIFFERENCE (m): 0.391
NRP Yrcs 2-SIGMA DIFFERENCE (m): 0.197
NRP Zrcs 2-SIGMA DIFFERENCE (m): 0.288

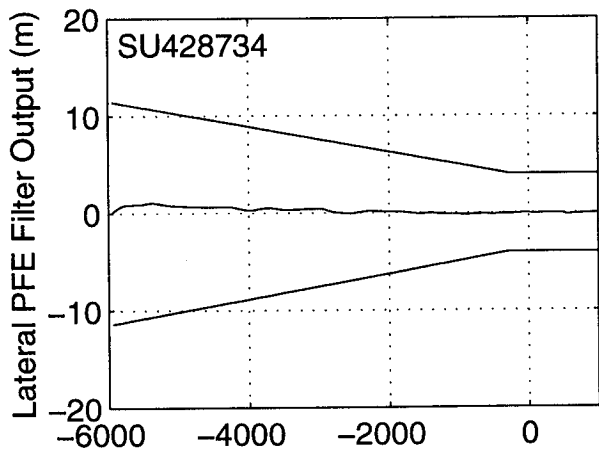
NRP Xrcs 2-RMS DIFFERENCE (m): 1.375
NRP Yrcs 2-RMS DIFFERENCE (m): 0.263
NRP Zrcs 2-RMS DIFFERENCE (m): 0.449

LANDING GEAR REFERENCE POINT TOUCHDOWN POSITION

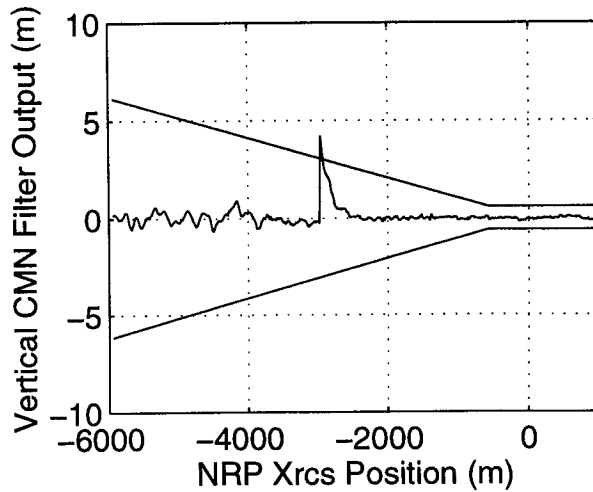
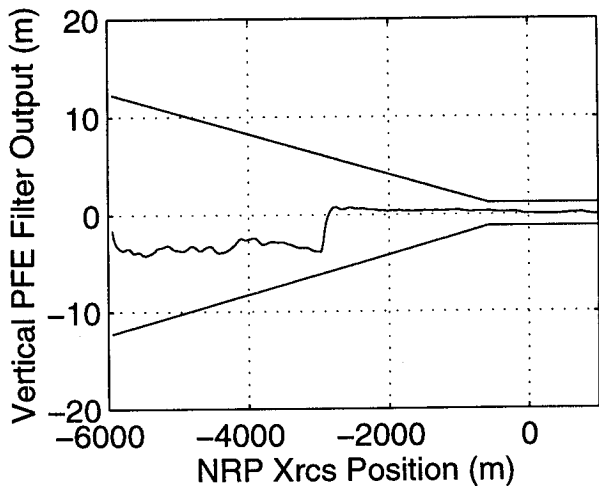
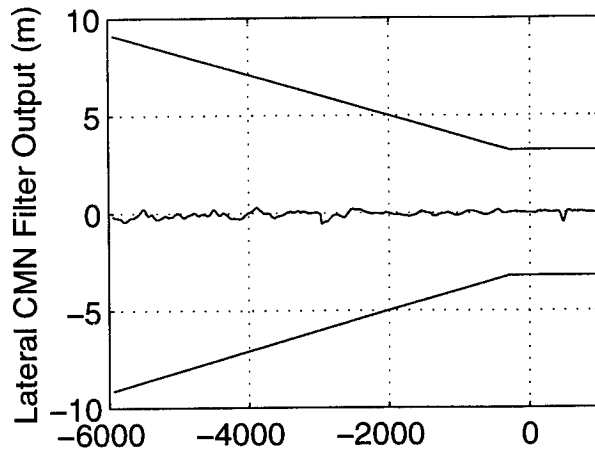
LGRP Xrcs POSITION (m): 99.080
LGRP Yrcs POSITION (m): 0.007



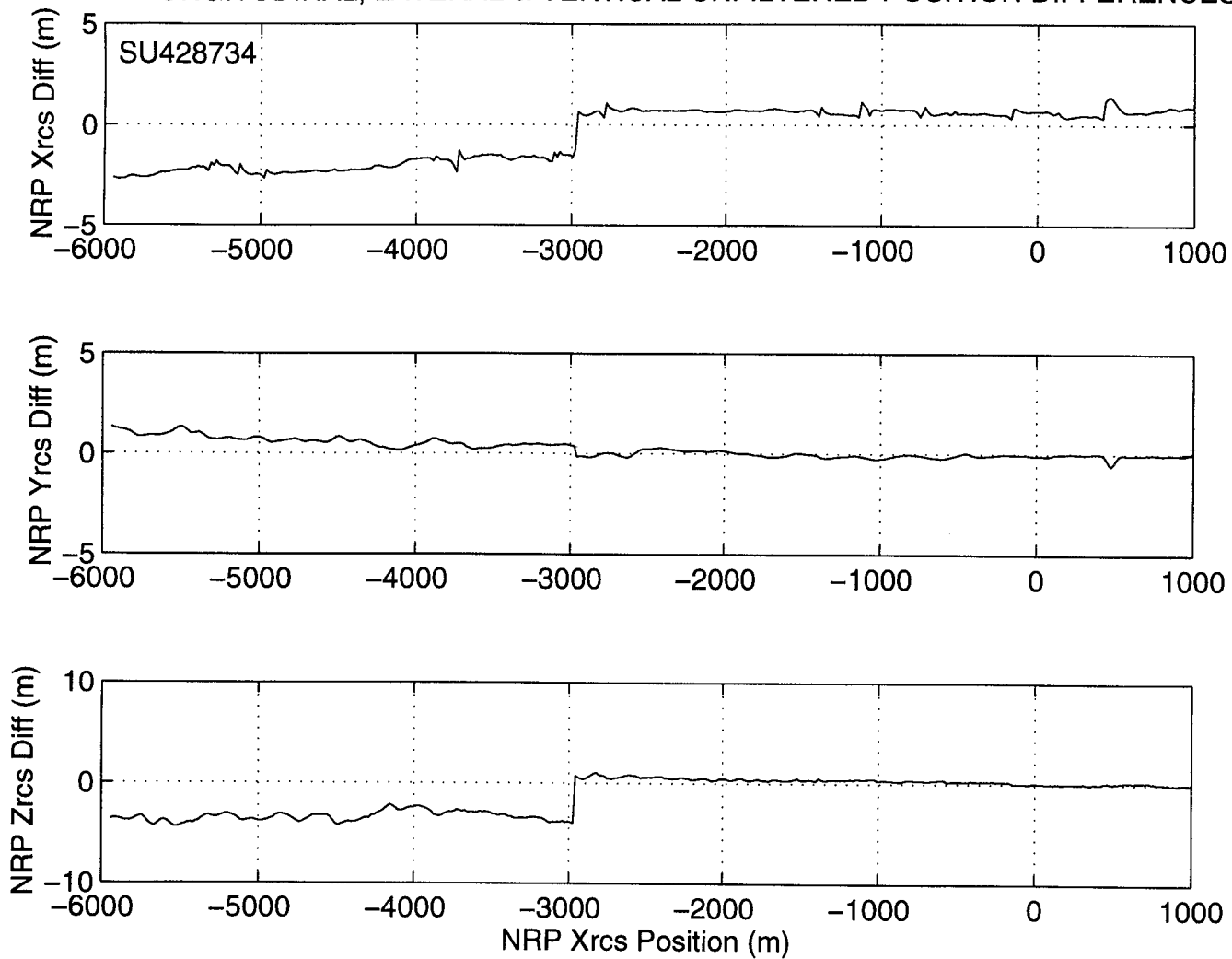
PATH FOLLOWING ERROR



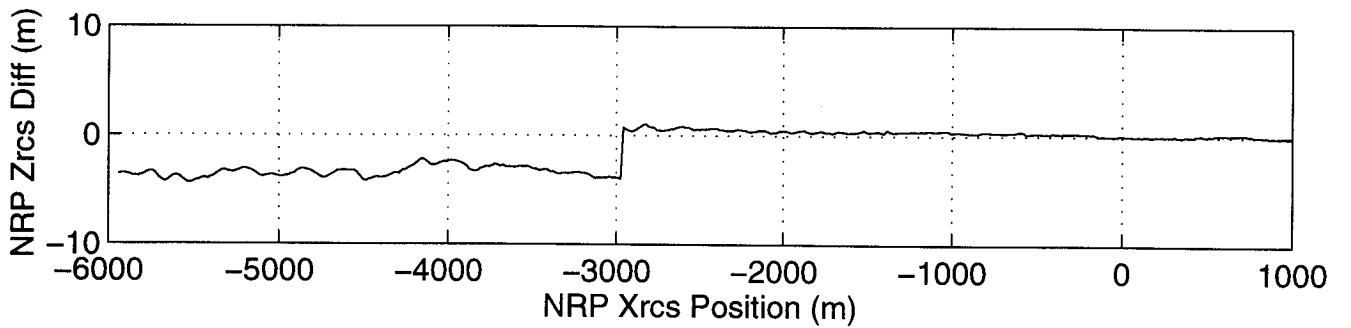
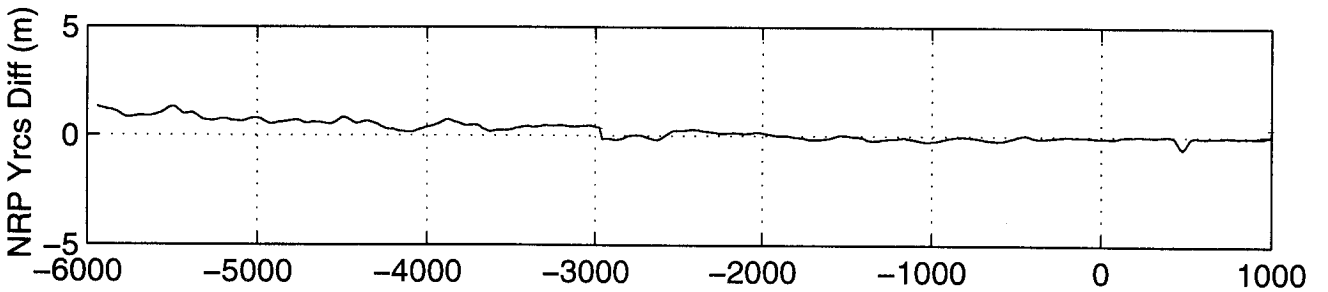
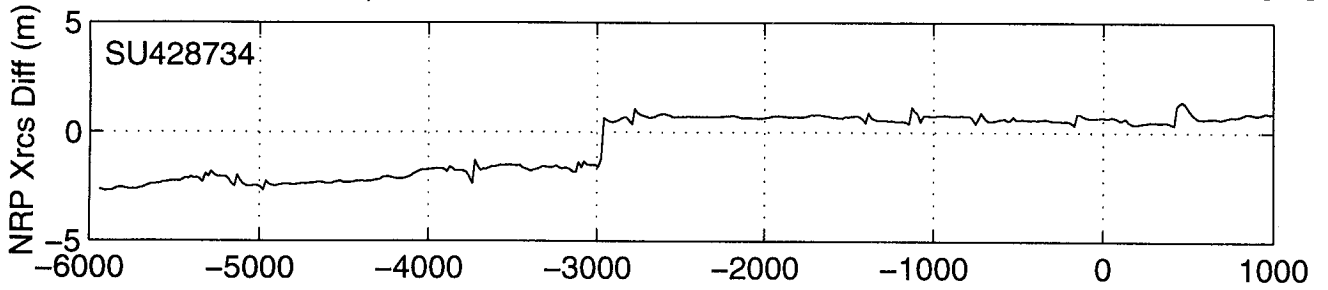
CONTROL MOTION NOISE



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



NRP LONGITUDINAL, LATERAL & VERTICAL UNFILTERED POSITION DIFFERENCES



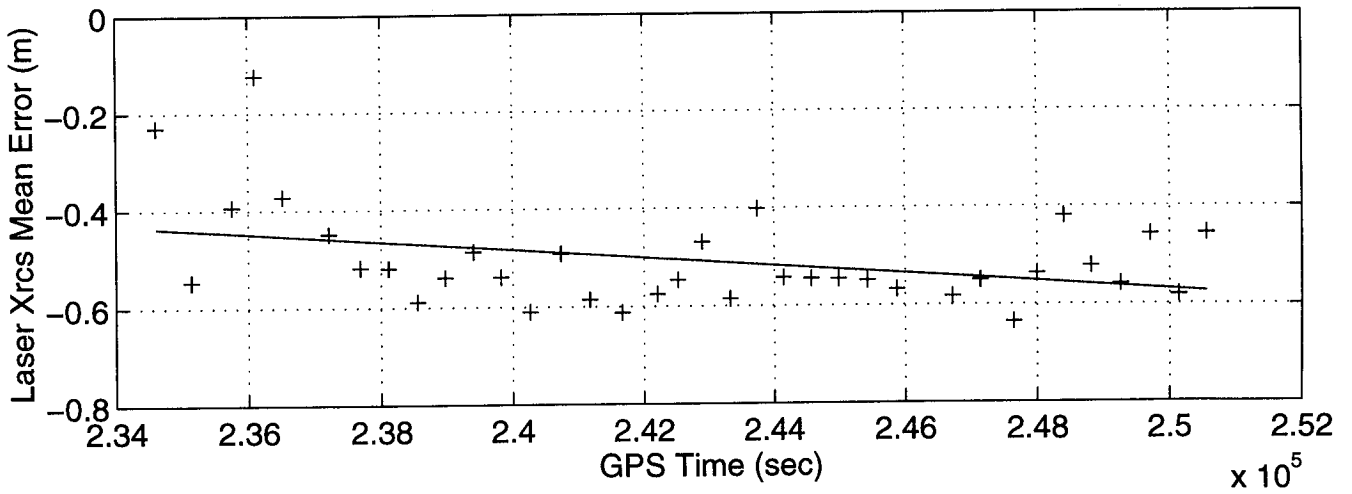
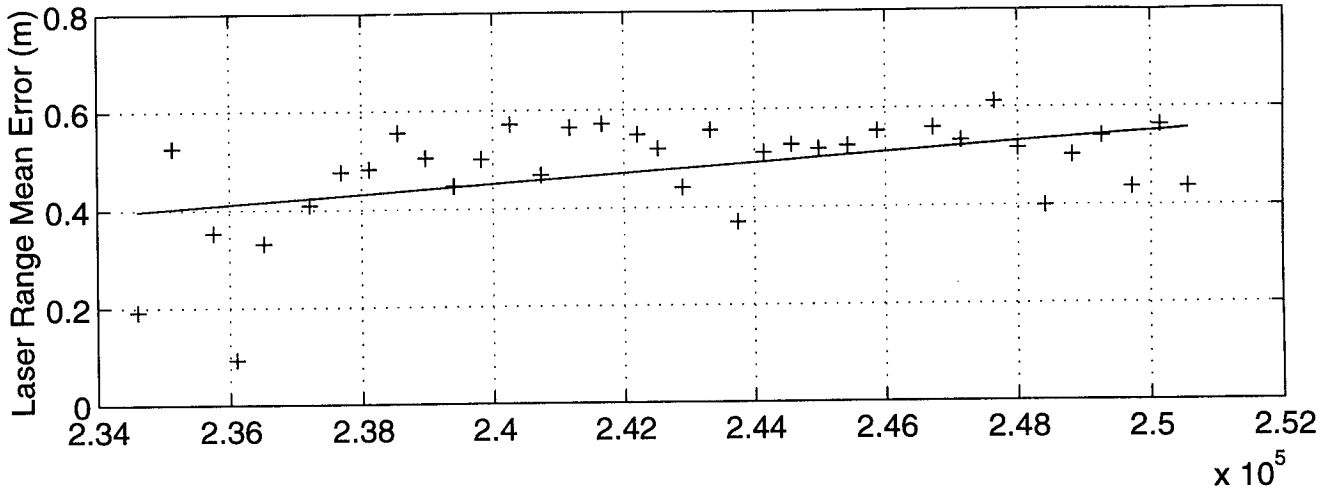
APPENDIX D

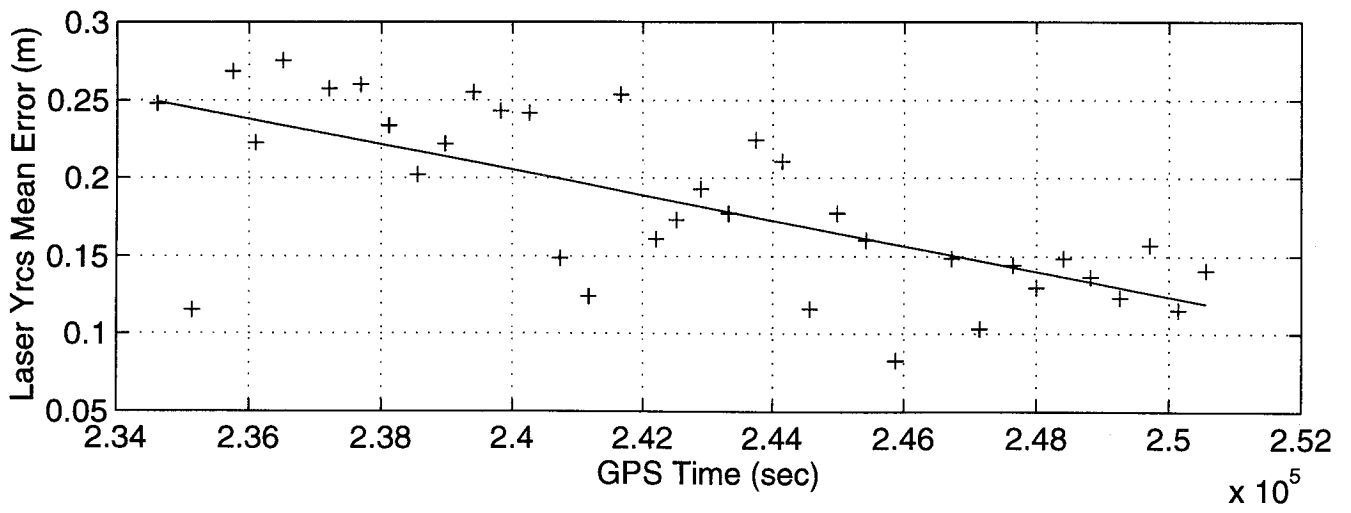
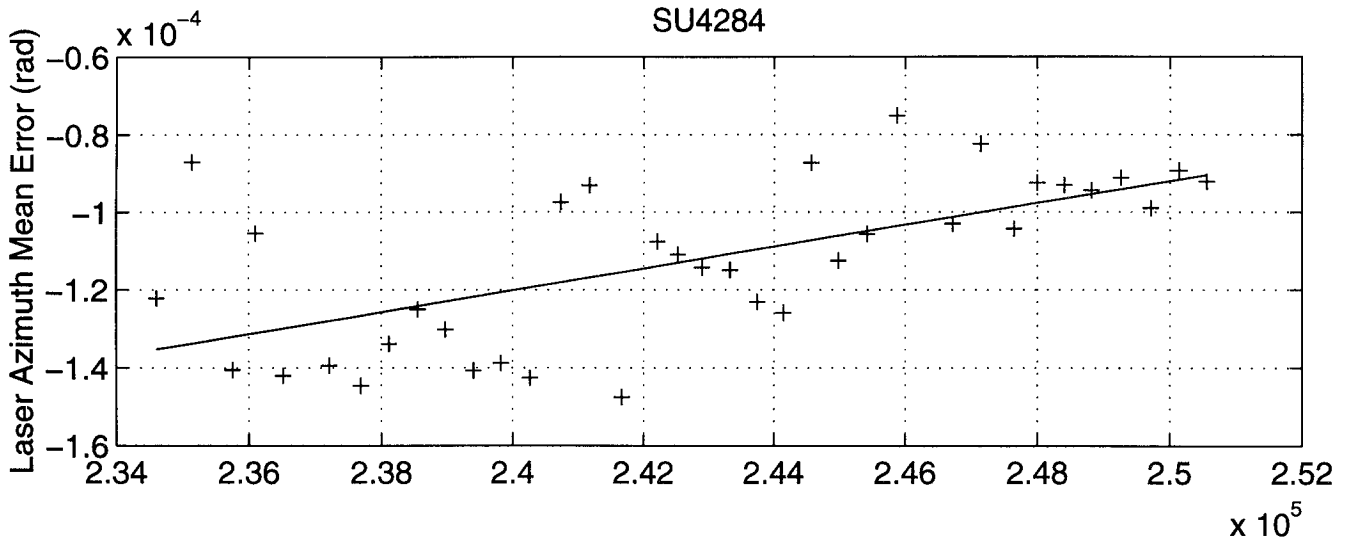
LASER TRACKER BIAS CORRECTION PLOTS

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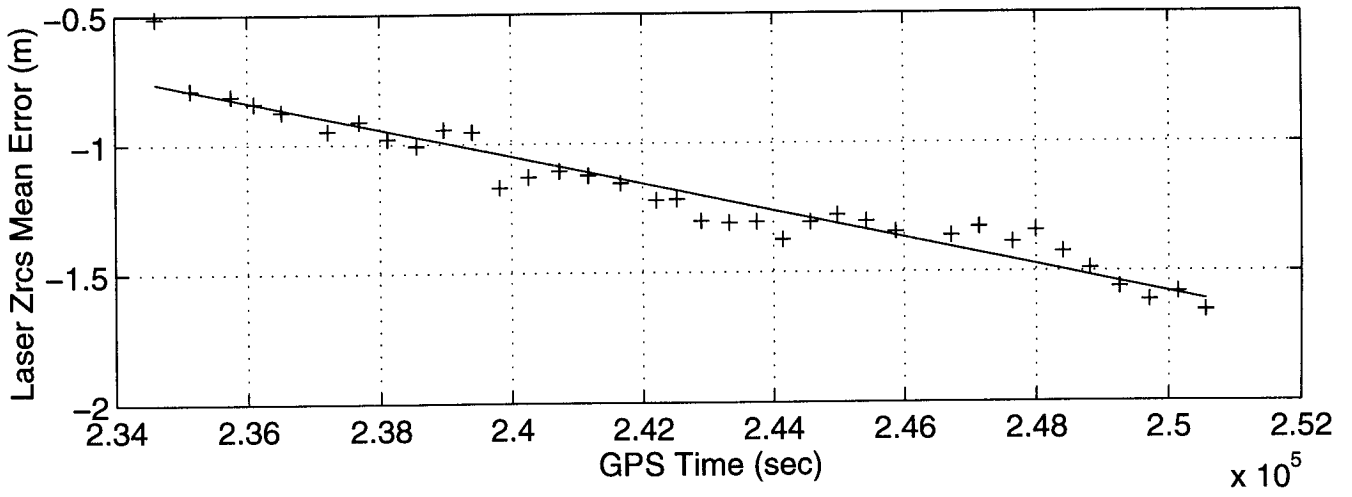
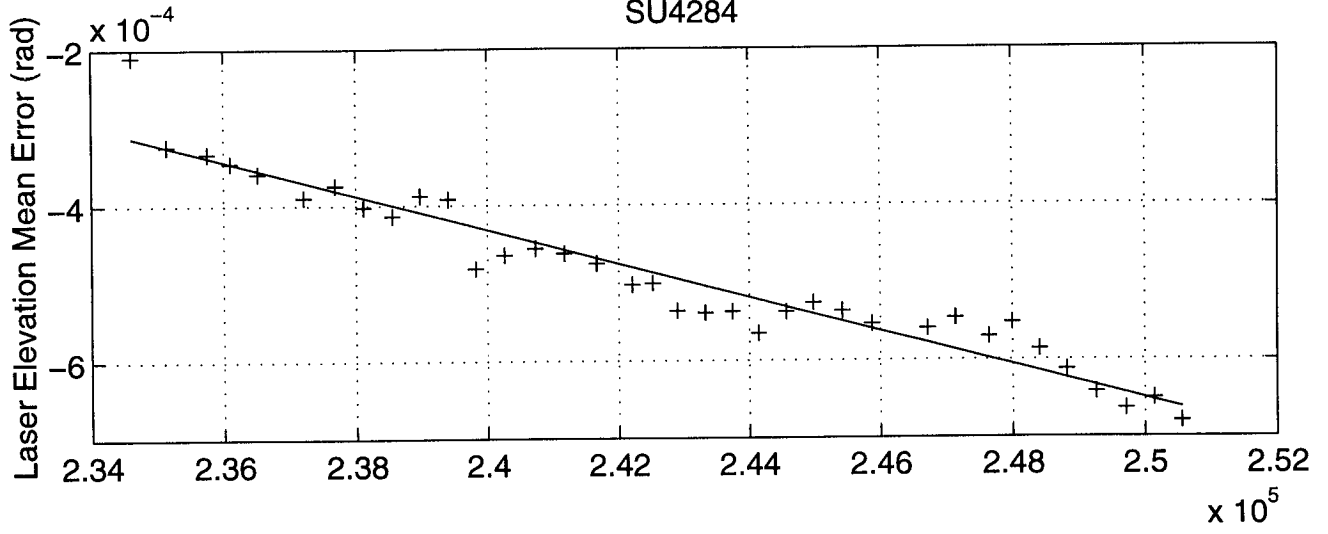
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SU4284

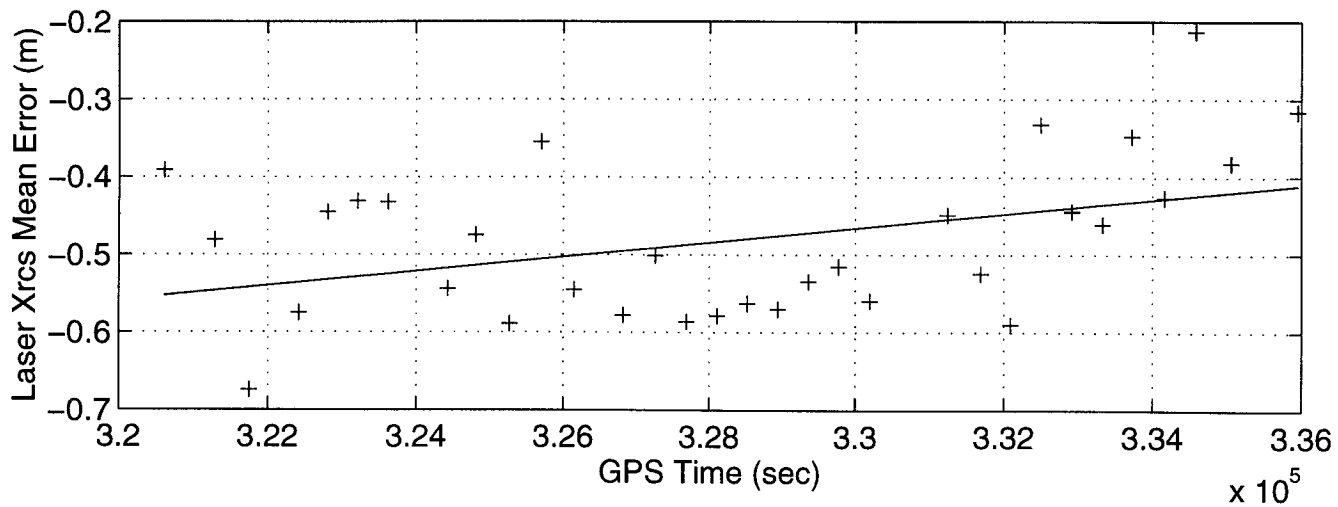
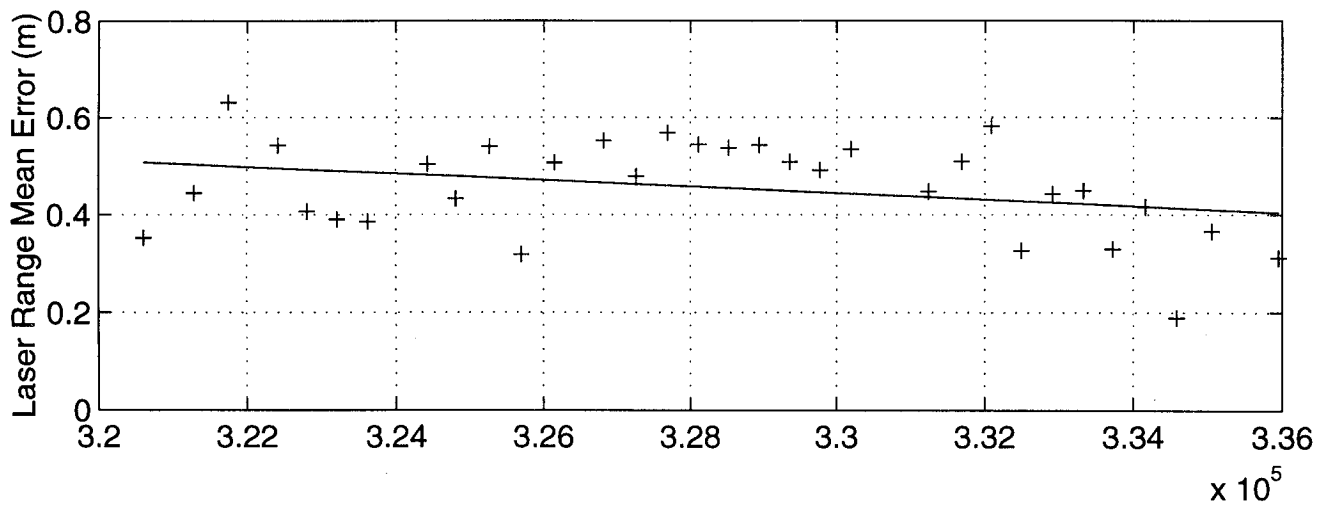


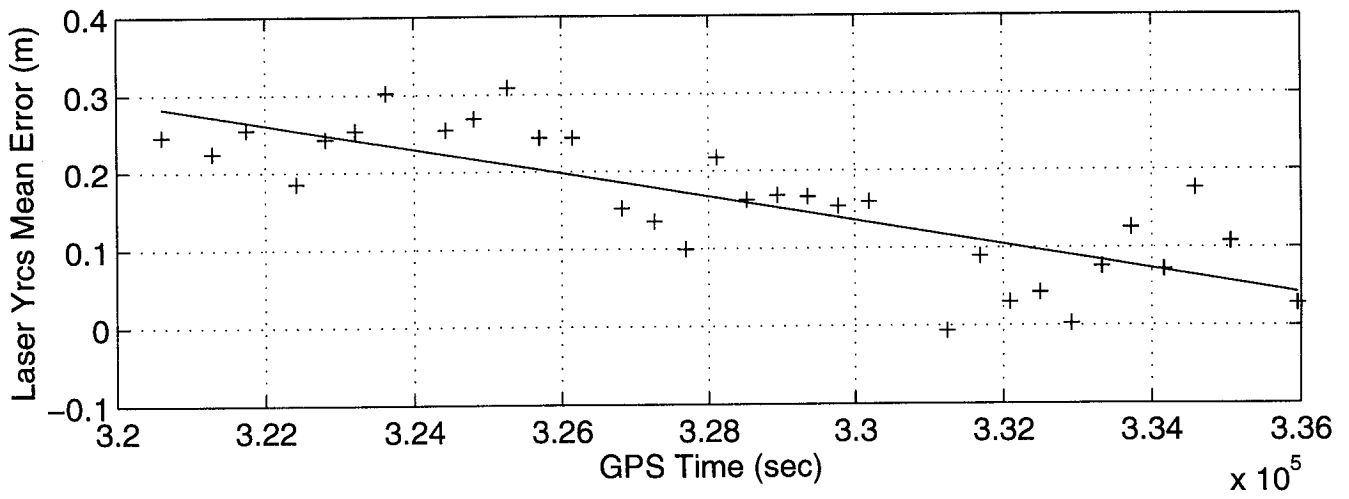
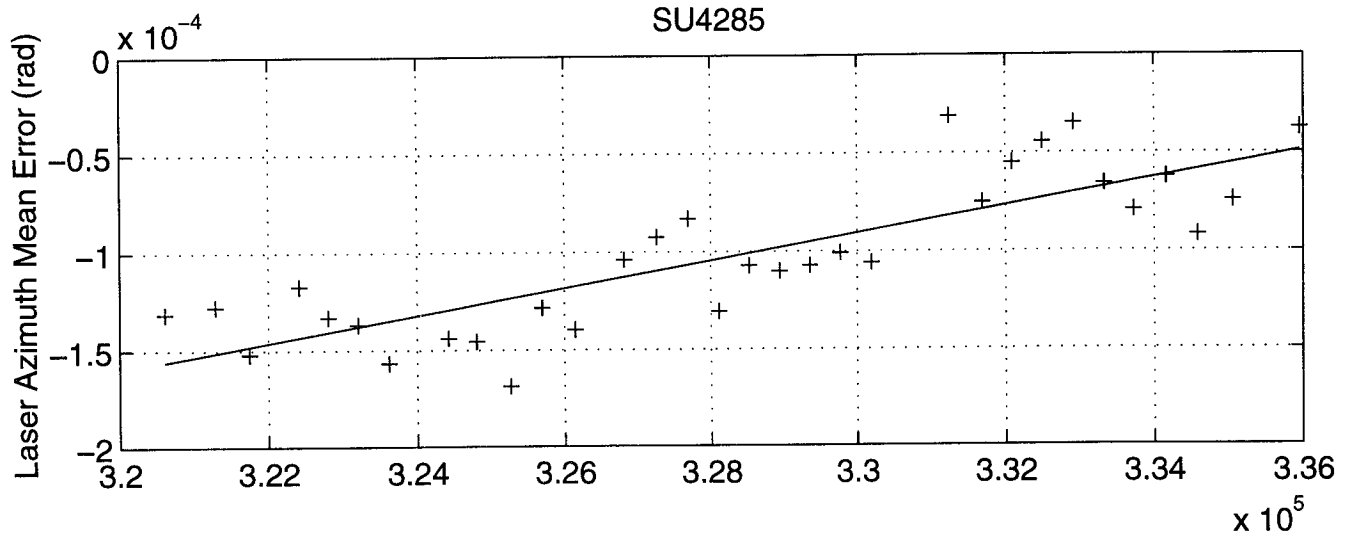


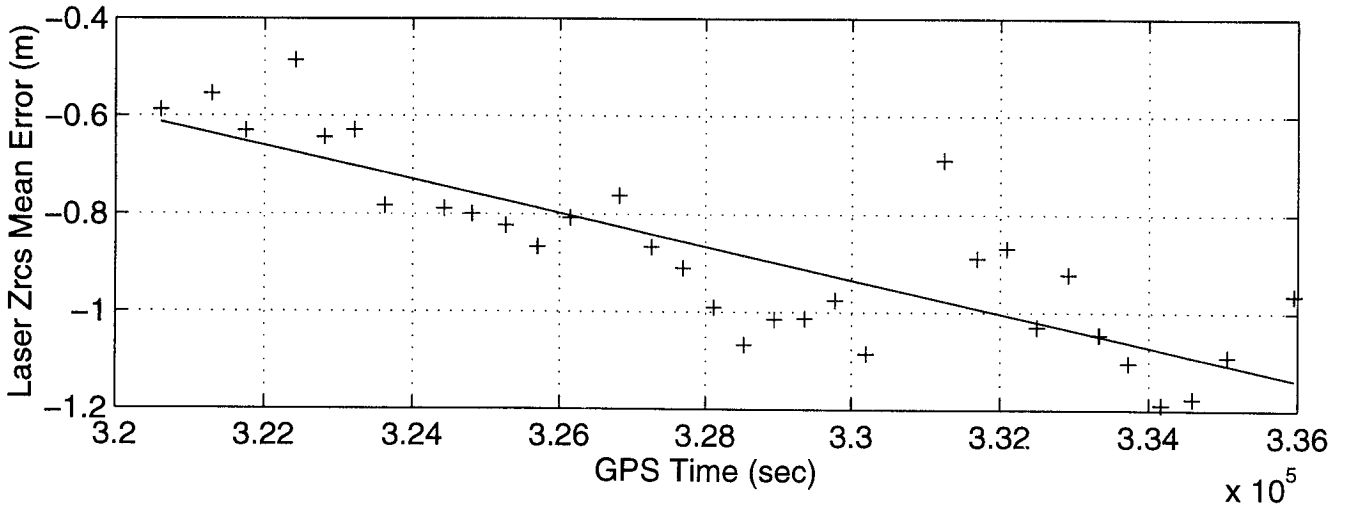
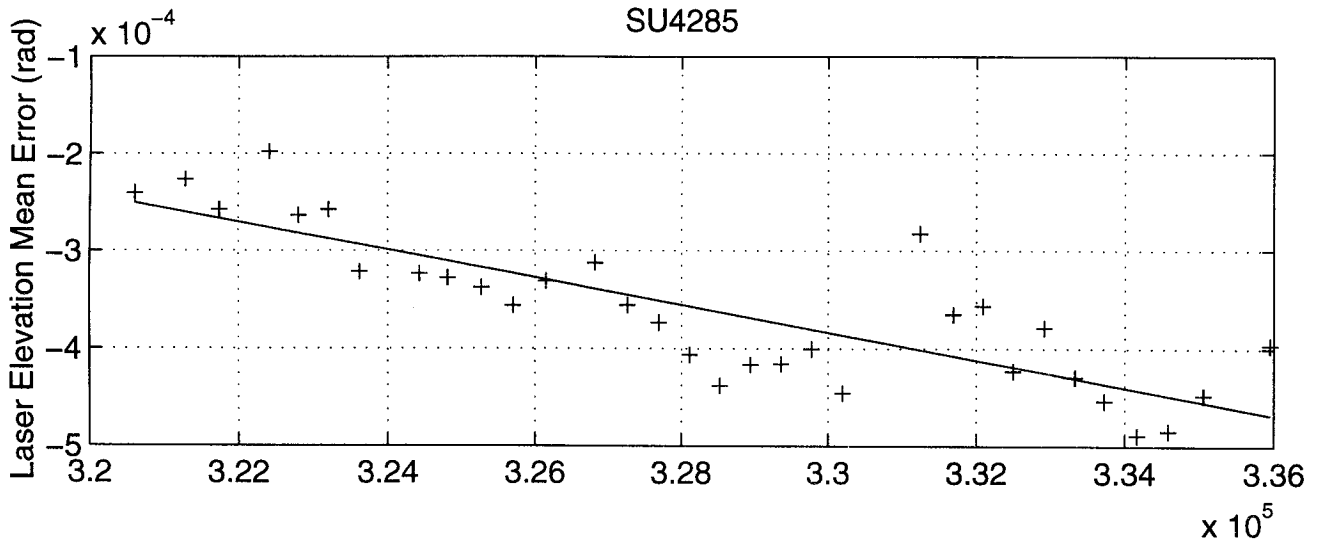
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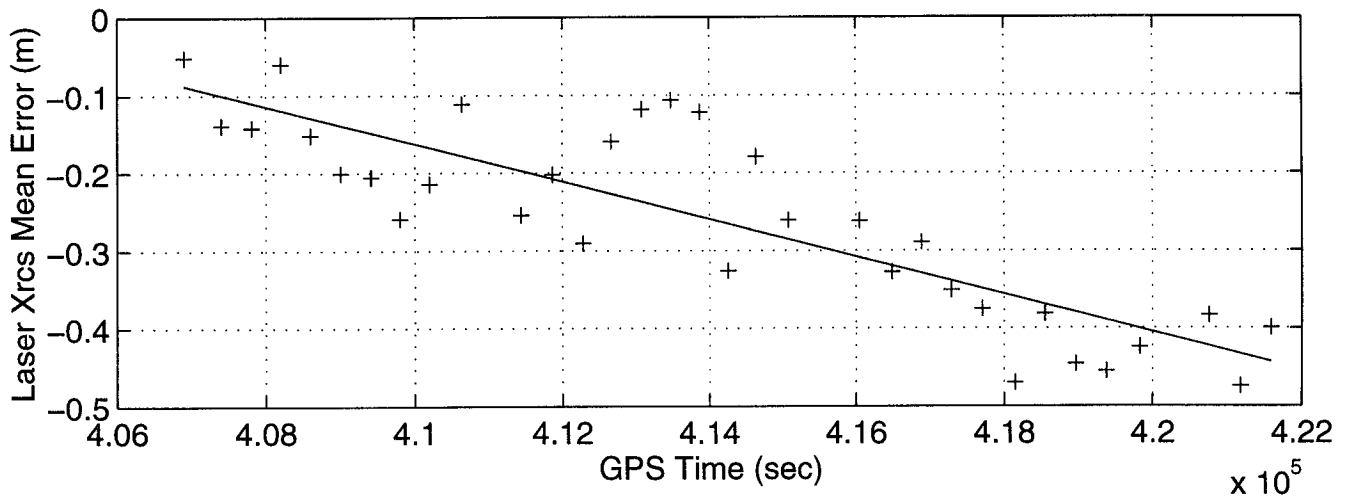
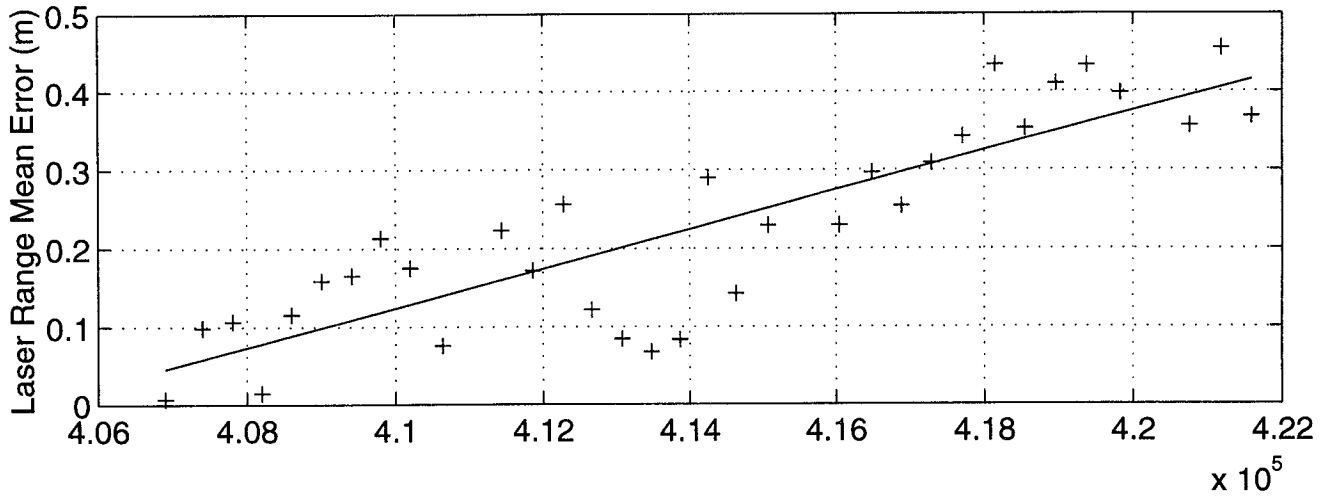
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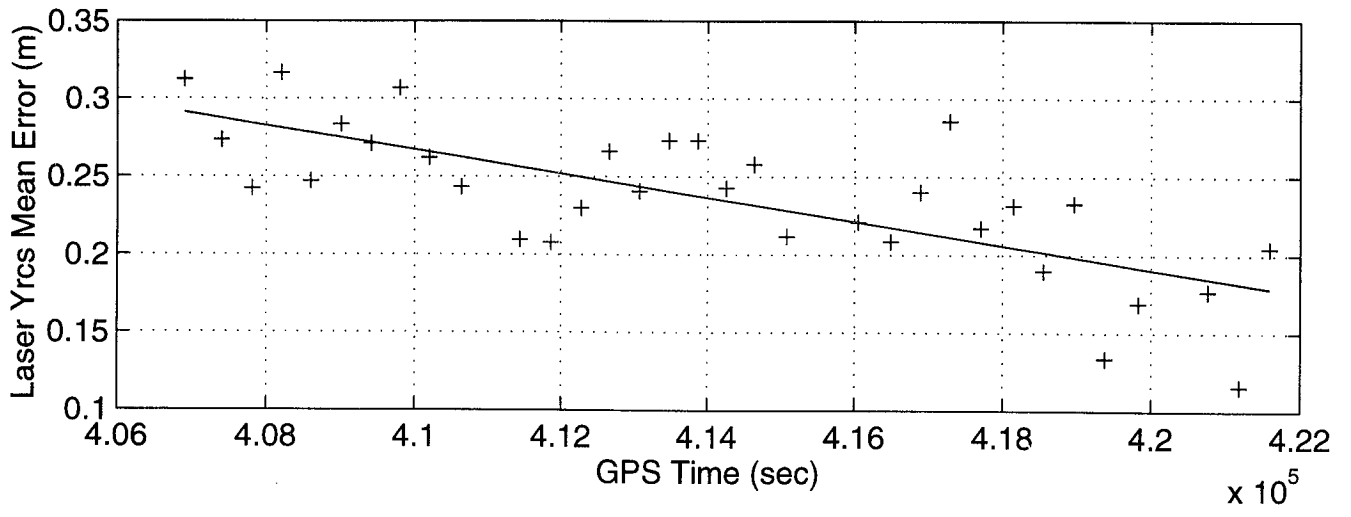
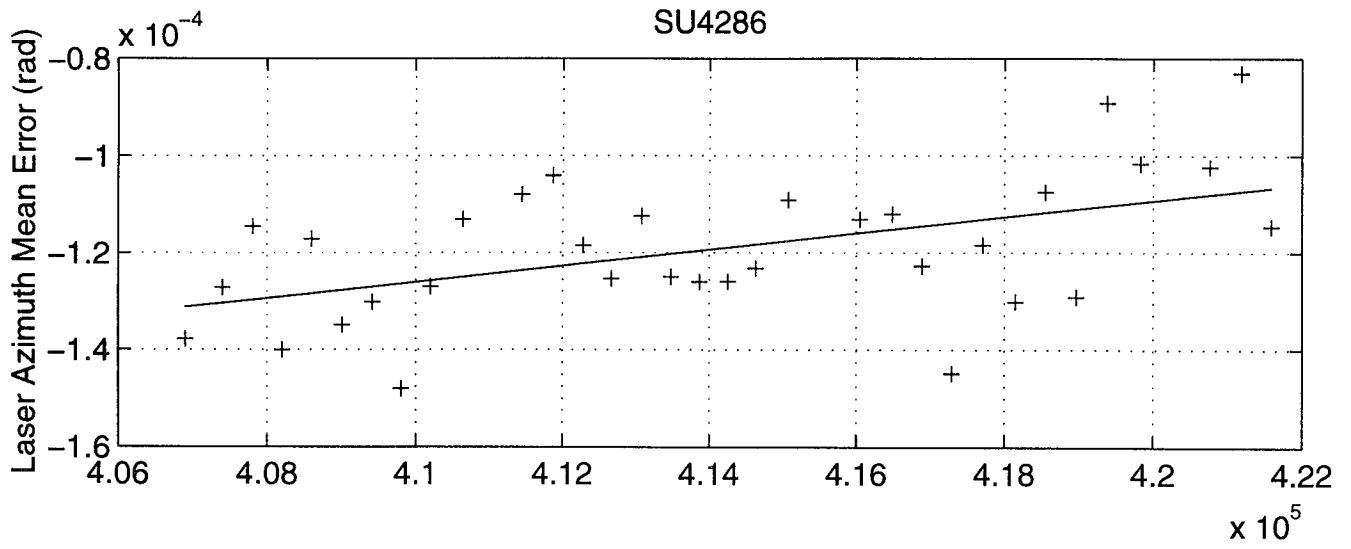




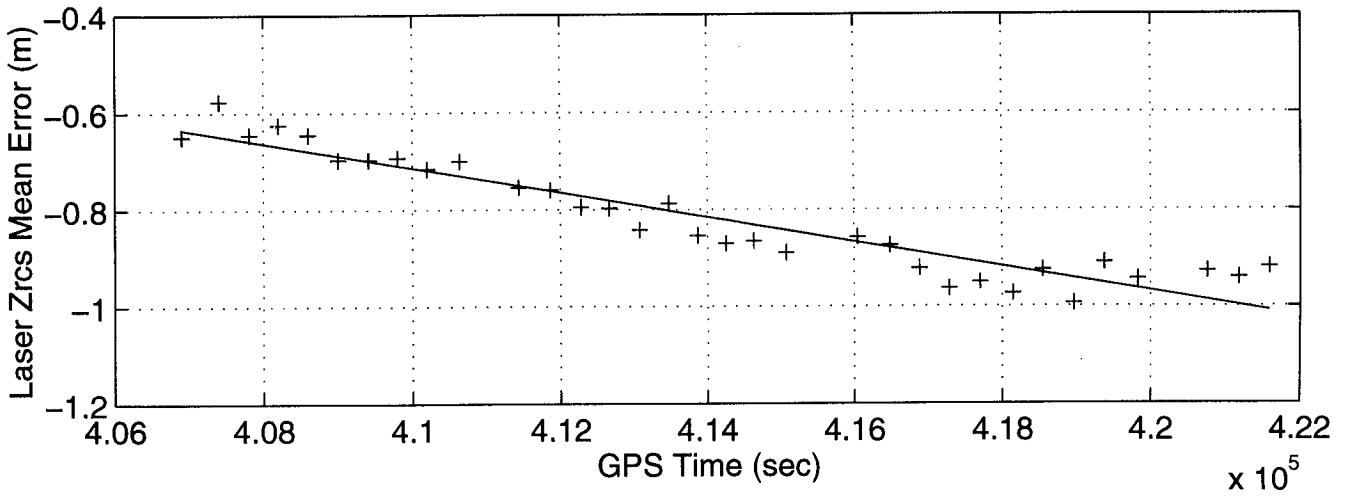
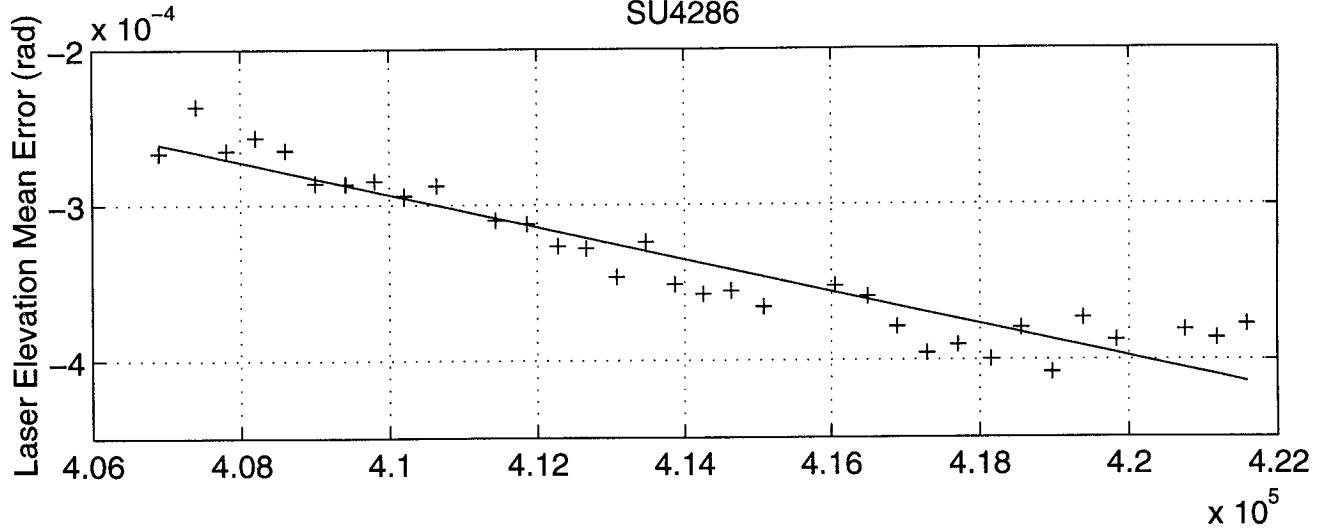


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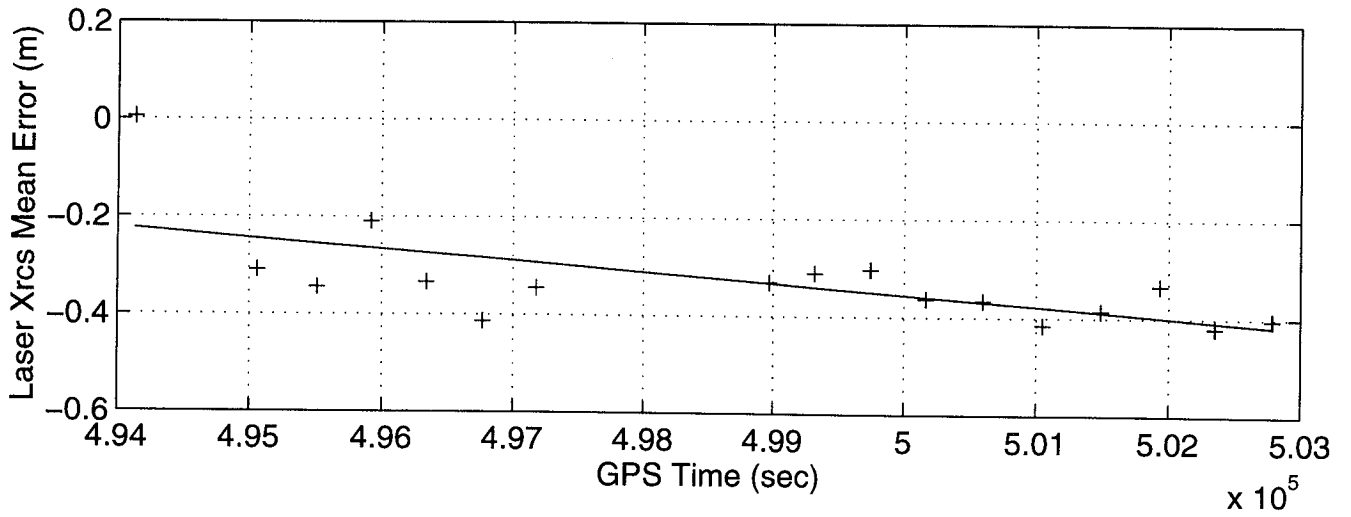
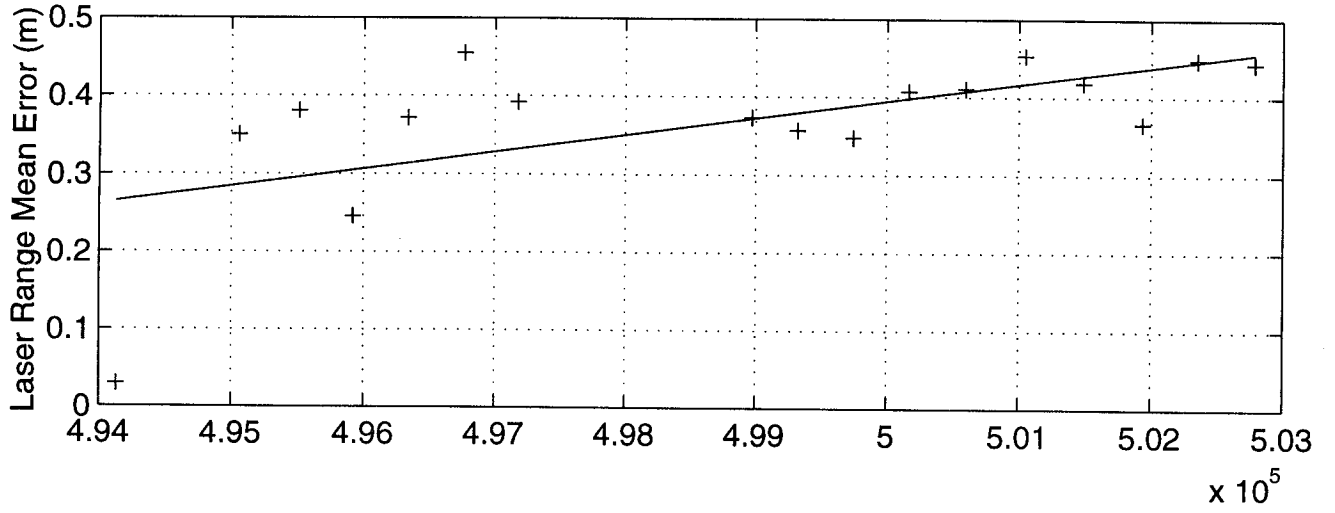


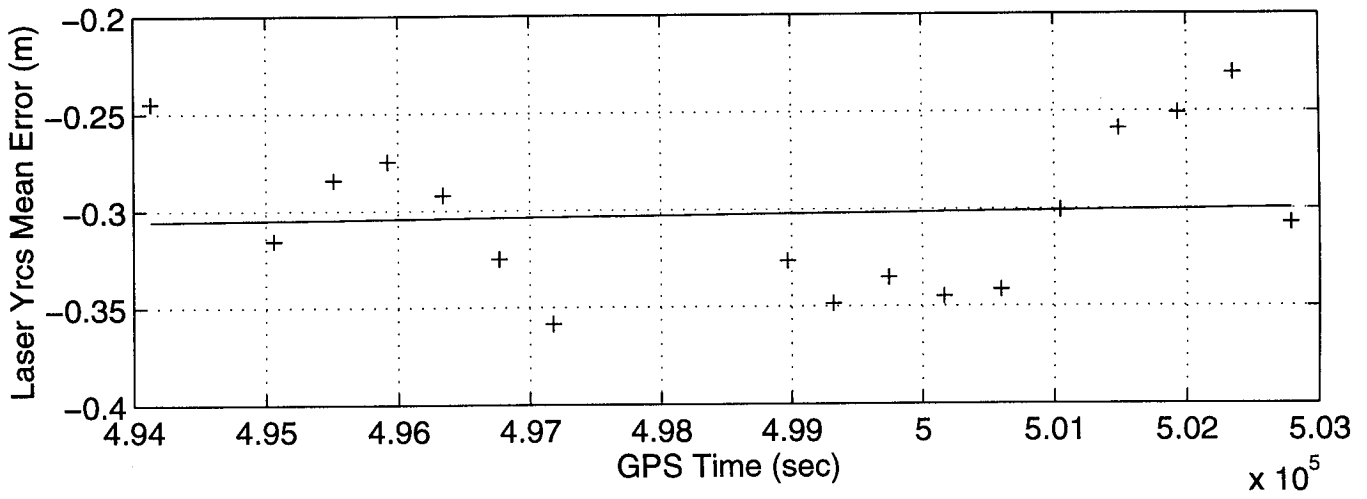
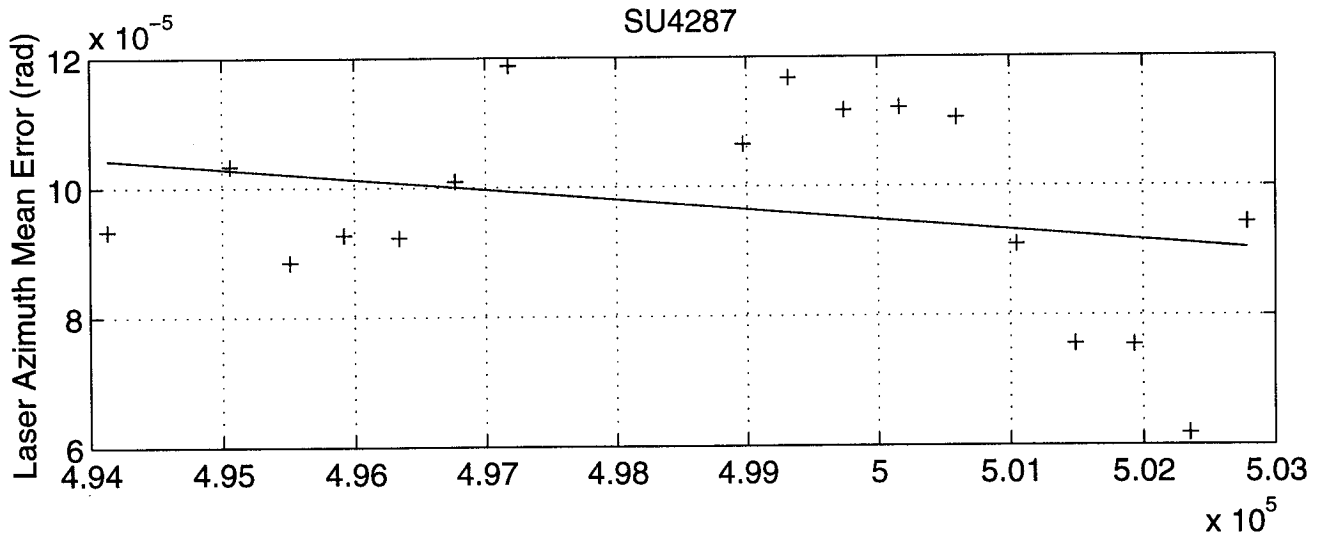


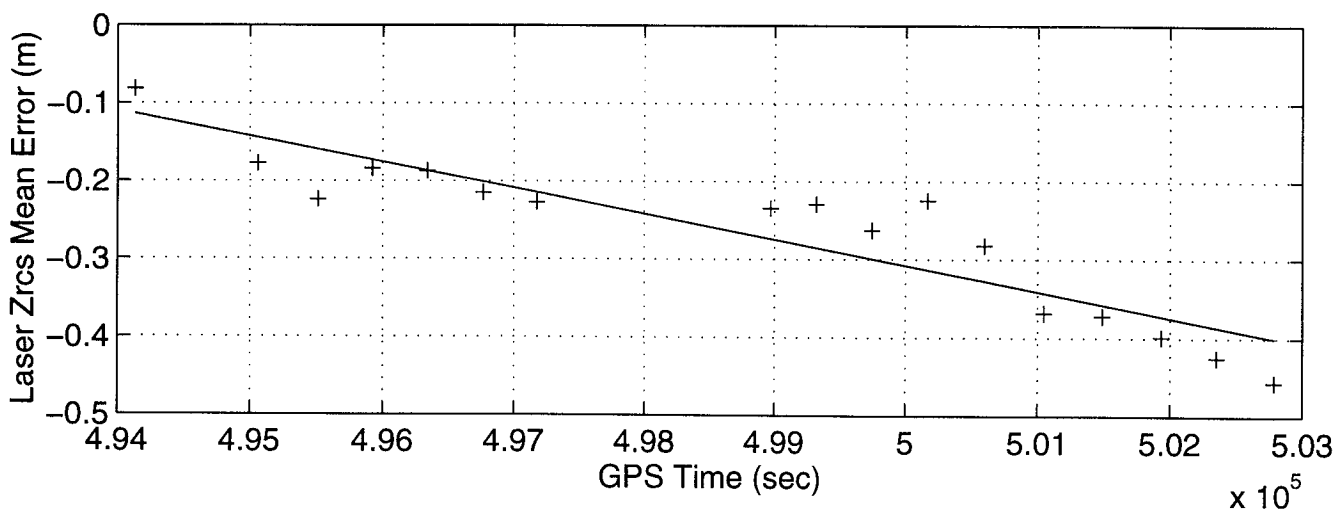
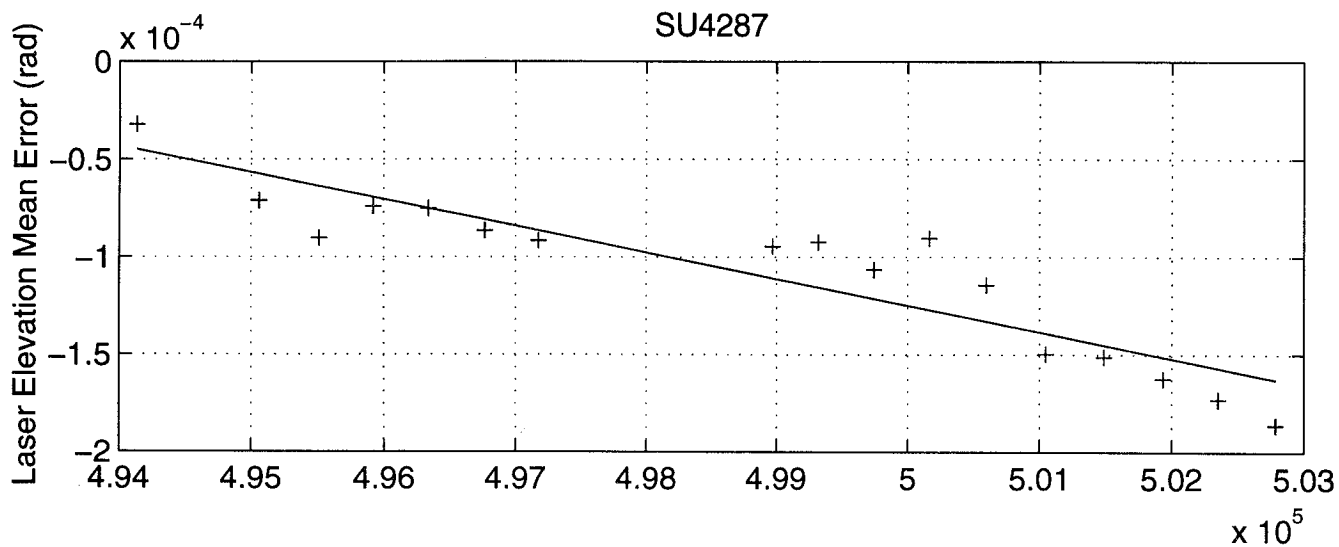
SU4286



SU4287







GLOSSARY

AP	Aim Point
CAT	Category
CG	Center of Gravity
CMN	Control Motion Noise
CTOL	Conventional Take-Off and Landing Aim Point
DGPS	Differential Global Positioning System
EOR	End of Runway
FAA	Federal Aviation Administration
FAF	Final Approach Fix
GS	Glide Slope
HAT	Height Above Threshold
HDOP	Horizontal Dilution of Precision
IAF	Initial Approach Fix
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
LCMN	Lateral Control Motion Noise
LFTE	Lateral Flight Technical Error
LGRP	Landing Gear Reference Point
LPFE	Lateral Path Following Error
LSE	Lateral Sensor Error
LTSE	Lateral Total System Error
LTSE _{estimate}	Lateral Total System Error Estimate
MLS	Microwave Landing System
MOS	Measure of Success
MSL	Mean Sea Level
NRP	Navigation Reference Point
N _{MAG}	Magnetic North
N _{TRUE}	True North
PFE	Path Following Error
RCLTSE	Rollout Control Lateral Total System Error
RCS	Runway Coordinate System
RNP	Required Navigation Performance
SV	Satellite Vehicle
TD	Touch Down
ULE	Unfiltered Lateral Error
UVE	Unfiltered Vertical Error
VCMN	Vertical Control Motion Noise
VDOP	Vertical Dilution of Precision
VFTE	Vertical Flight Technical Error
VMC	Visual Meteorological Conditions
VPFE	Vertical Path Following Error
VSE	Vertical Sensor Error
VTSE	Vertical Total System Error
VTSE _{estimate}	Vertical Total System Error Estimate
X _r cs	Runway Coordinate System X Direction
Y _r cs	Runway Coordinate System Y Direction
Z _r cs	Runway Coordinate System Z Direction
$ u +2SIG$	Mean Absolute Value + Two Sigma Standard Deviation
2RMS	Two Root Mean Square
2SIGUCL	Two Sigma Standard Deviation Upper Confidence Level
95P	95 th Percentile

REPORT DOCUMENTATION PAGE

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6. AUTHOR(S) David N. Kaufmann and B. David McNally		8. PERFORMING ORGANIZATION REPORT NUMBER A-950066	
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13. ABSTRACT (Maximum 200 words) <p>Test flights were conducted to evaluate the capability of Differential Global Positioning System (DGPS) to provide the accuracy and integrity required for International Civil Aviation Organization (ICAO) Category (CAT) III precision approach and landings. These test flights were part of a Federal Aviation Administration (FAA) program to evaluate the technical feasibility of using DGPS based technology for CAT III precision approach and landing applications.</p> <p>A United Airlines Boeing 737-300 (N304UA) was equipped with DGPS receiving equipment and additional computing capability provided by Stanford University. The test flights were conducted at NASA Ames Research Center's Crows Landing Flight Facility, Crows Landing, California. The flight test evaluation was based on completing 100 approaches and autolandings; 90 touch and go, and 10 terminating with a full stop. Two types of accuracy requirements were evaluated: 1) Total system error, based on the Required Navigation Performance (RNP), and 2) Navigation sensor error, based on ICAO requirements for the Microwave Landing System (MLS).</p> <p>All of the approaches and autolandings were evaluated against ground truth reference data provided by a laser tracker. Analysis of these approaches and autolandings shows that the Stanford University/United Airlines system met the requirements for a successful approach and autolandings 98 out of 100 approaches and autolandings, based on the total system error requirements as specified in the FAA CAT III Level 2 Flight Test Plan.</p>			
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		16. PRICE CODE A20	
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