Overview of MSFC Natural Environments Proposed Use of Doppler Radar Wind Profilers on Day-of-Launch

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Background

- Marshall Space Flight Center Natural Environments (MSFC NE) has developed algorithms to generate vertically complete profiles from the Eastern Range Doppler Radar Wind Profiler (DRWP) network.
  - Automated quality control (QC)
  - Interpolating schemes
  - Filtering
  - Manual QC
- Spliced profiles are used in Space Launch System trajectory and loads design analyses.
- Evaluate how to incorporate algorithms to process spliced profiles on day-of-launch.
- MSFC NE is planning to develop the capability to generate a vertically complete wind profile from any source during day-of-launch (DOL) operations.
Proposed Method to Generate DOL Wind Profiles

Data from the Eastern Range
- Balloon*
- 50-MHz DRWP*
- 915-MHz DRWP
  * QC’ed

MSFC NE Processing (Nominal)
- Automated QC (915-MHz DRWP)
- Generate vertically complete DRWP profile
- Splice balloon and vertically complete DRWP profile
- Filtering
- Manual examination

Output profile

- MSFC NE briefs DOL team on measurement system status before DOL.
- MSFC NE generates output wind profile based on a posteriori knowledge and QC.
- MSFC NE distributes output wind profile through the Meteorological Interactive Data Display System (MIDDS) to users at JSC and KSC.
Forward Work

• Develop software to process real-time data from MIDDS on DOL.
  – Define software requirements.
  – Incorporate DRWP splicing and wind filtering algorithms.
  – Enable MSFC NE DOL personnel to quickly and efficiently examine profiles and select the profile to use.
  – Perform verification and validation tests.
• Estimated completion date spring 2015.
Backup
Available Data

- Overlay wind profiles from different sources.
  - DRWP
  - Balloon
- DRWP profiles
  - QC’ed 50-MHz DRWP data from the Eastern Range.
  - Non-QC’ed 915-MHz DRWP data from ER. Data QC’ed by MSFC.
  - DRWP profiles spliced by MSFC NE.
- Manual examination needed.
- Selected profile written to file for distribution to end users.