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SOLAR ULTRAVIOLET SPECTRAL IRRADIANCE MONITOR EXPERIMENT ON OSS-1

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The need to improve the accuracy of measurement of the absolute solar flux within the wavelength range 120-400 nm requires an extensive effort in contamination control and in tracking the instruments stability. The techniques used in the Solar Ultraviolet Spectral Irradiance Monitor (SUSIM) flown by the Naval Research Laboratory on OSS-1 will be described. These methods have resulted in very high calibration stability as proven by pre-flight and post-flight calibration. In-flight calibration and the pointing accuracy provided by the Shuttle attitude control system will also be discussed.

SOLAR ULTRAVIOLET SPECTRAL IRRADIANCE MONITOR
(SUSIM)

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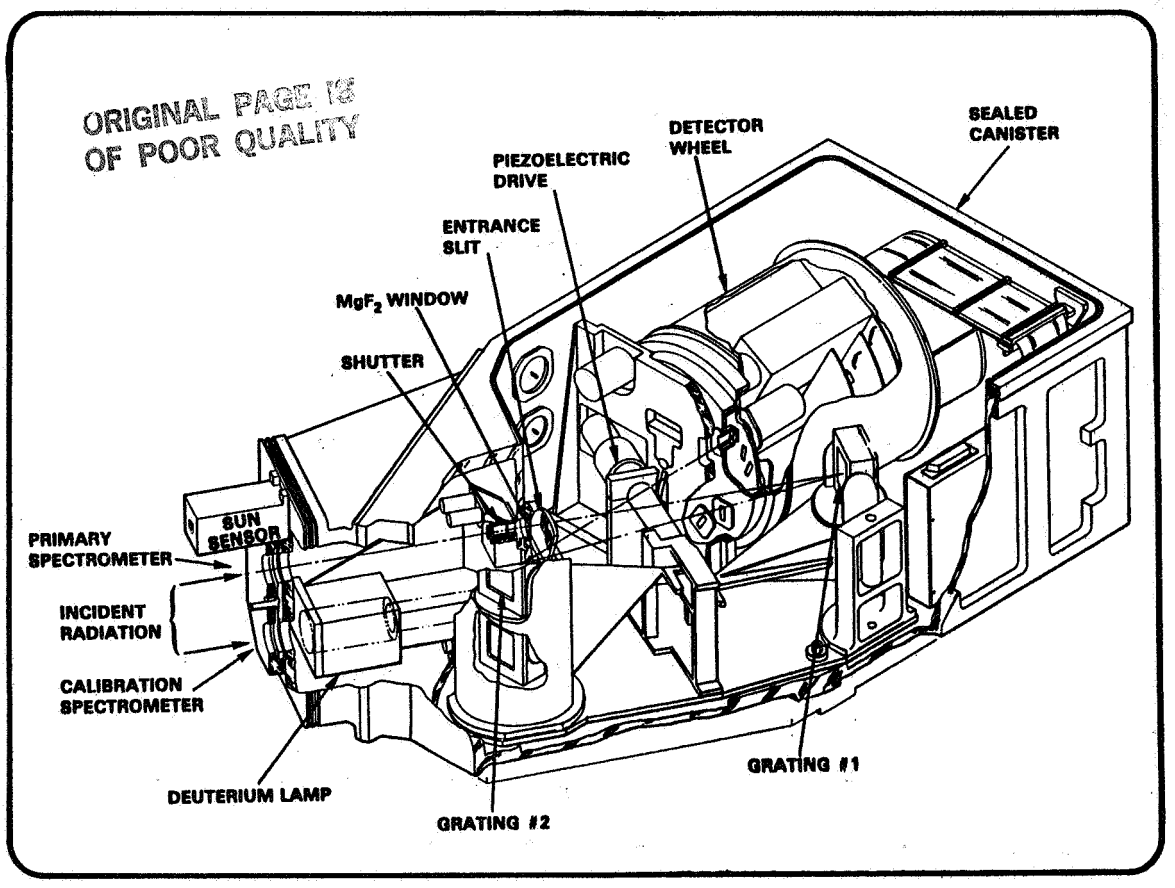
SCIENTIFIC OBJECTIVE

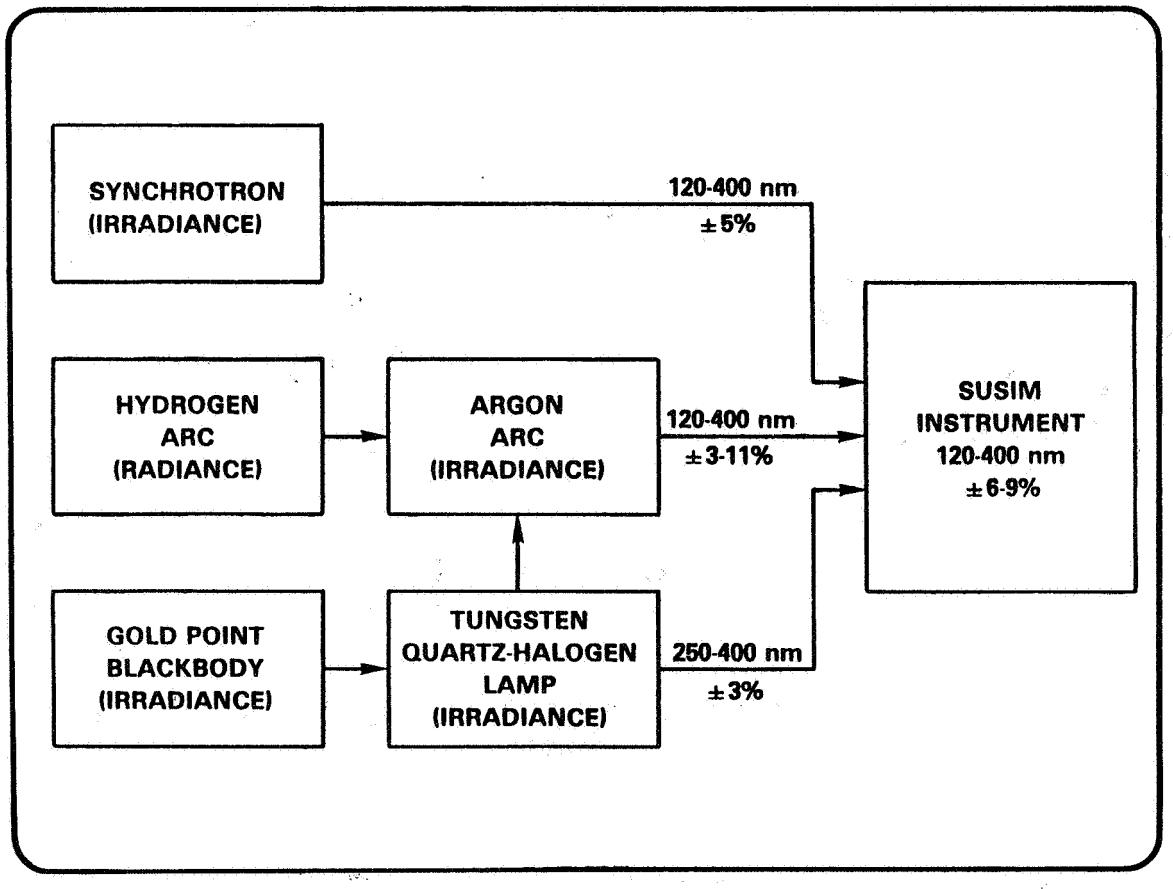
HIGH PRECISION SOLAR ULTRAVIOLET IRRADIANCE MEASUREMENTS TO DETERMINE ABSOLUTE FLUX IN THE 120-400 NM REGION AND ITS VARIATION OVER AN 11-YEAR SOLAR CYCLE.

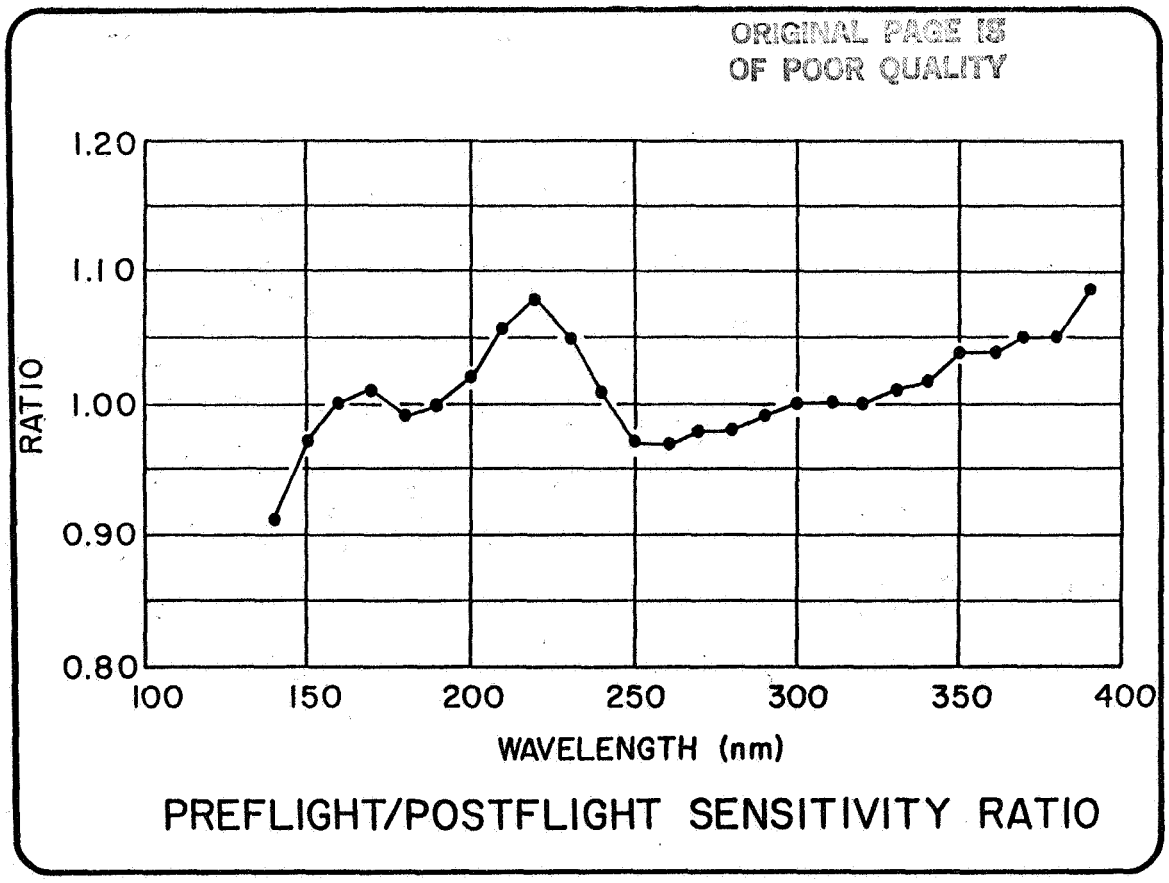
FIRST FLIGHT OF A NEW HIGH PRECISION PHOTOMETER

IMPROVEMENTS OVER PREVIOUS INSTRUMENTS:

1. IN-FLIGHT TRACKING SOURCE
2. TWIN SPECTROMETERS
3. DOUBLE DISPERSION ARRANGEMENT
4. MULTI-DETECTOR APPROACH
5. USE OF HIGH STABILITY DIODES
6. IN-FLIGHT ELECTRICAL CALIBRATION
7. COMPUTER-CONTROLLED OBSERVING SEQUENCES







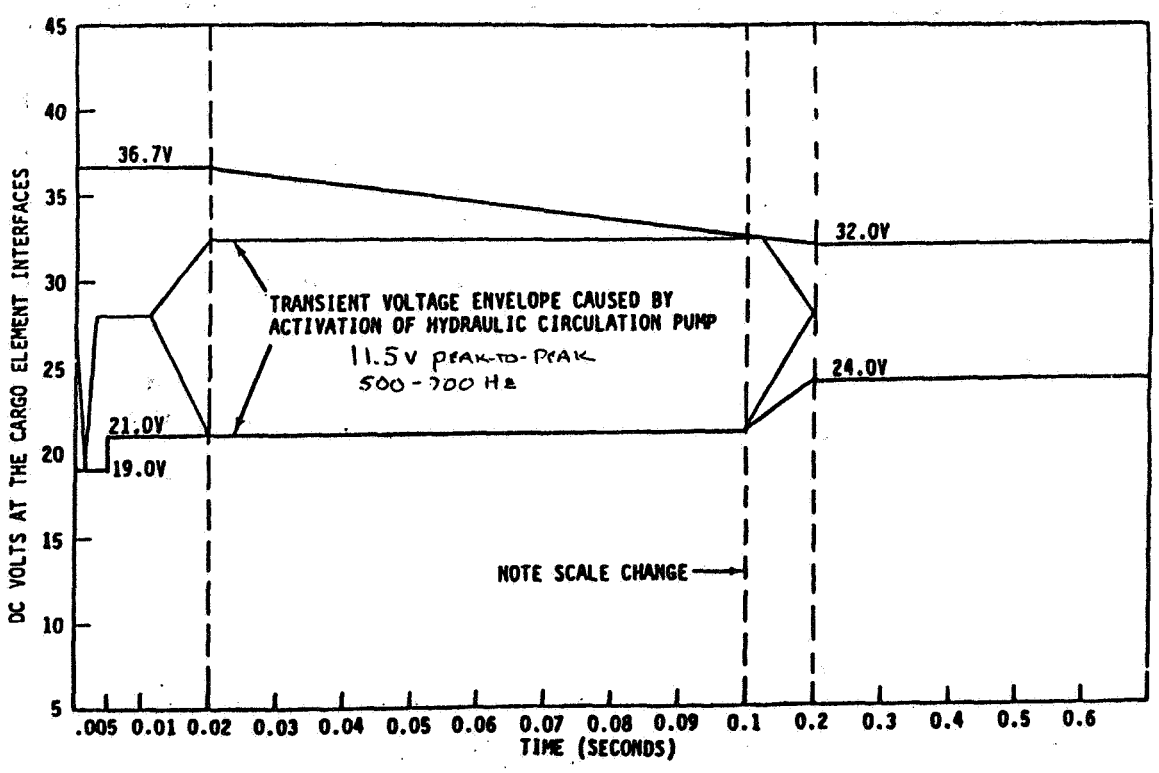
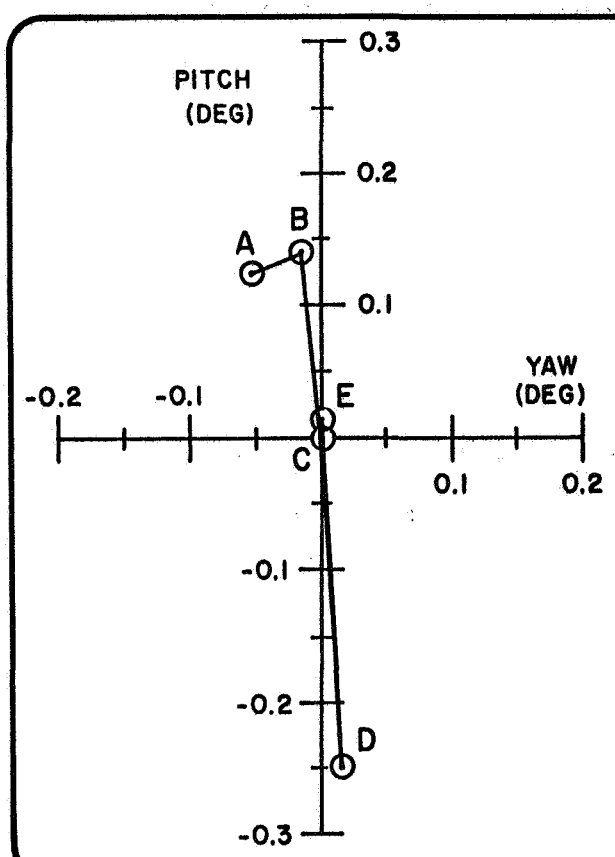


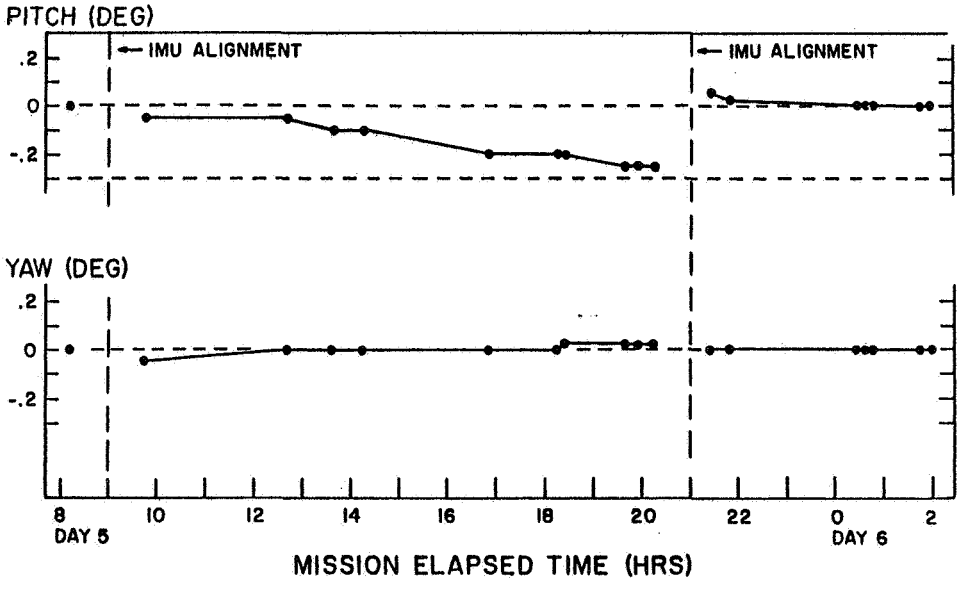
Figure 7.2.2-1 Transient Voltage Limits of Aft DC Buses B and C *Only*

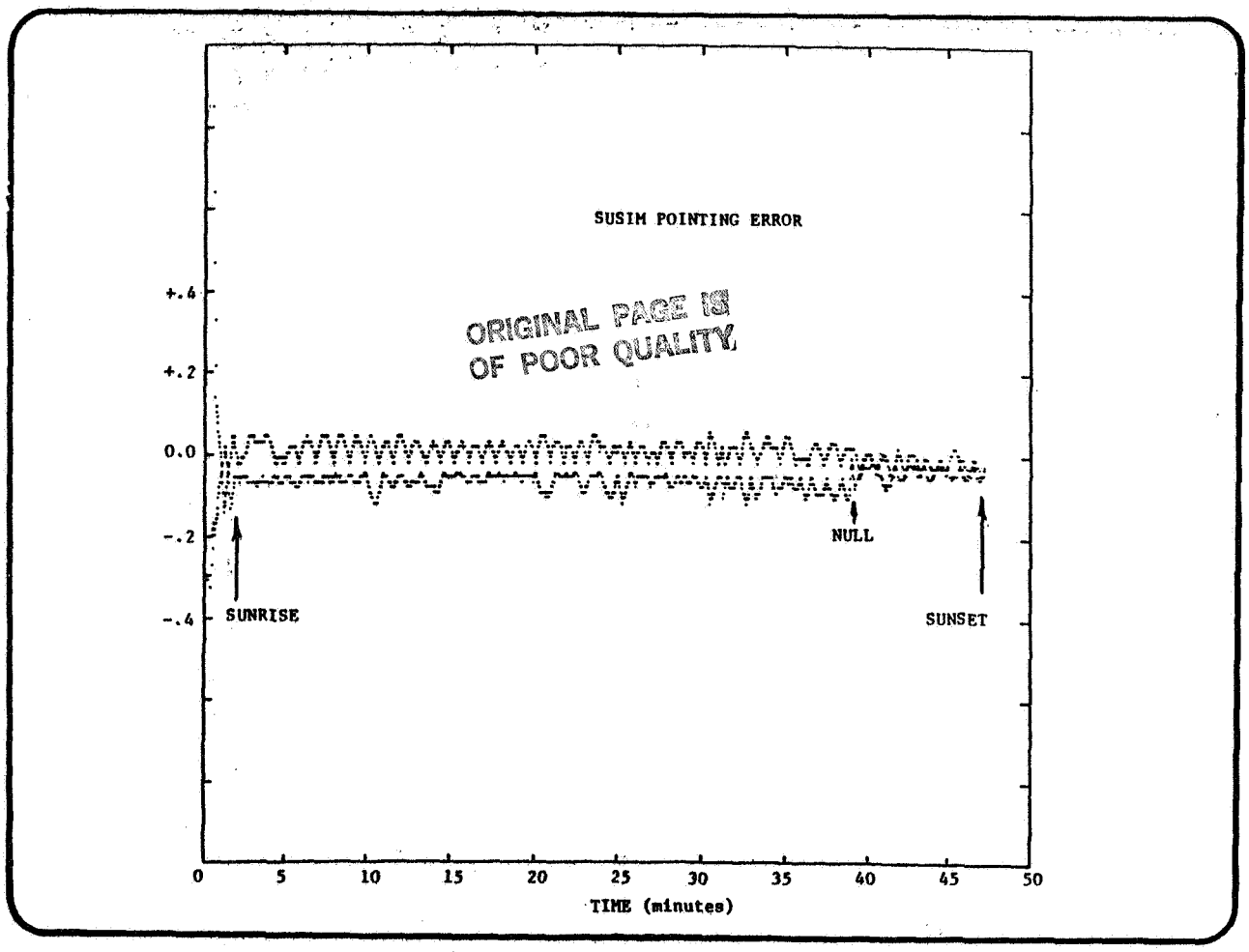


SUSIM-TO-ORBITER ALIGNMENT

A - PRE-LAUNCH ALIGNMENT
B - AFTER TOP-TO-SUN MANEUVER
C - AFTER NULLINGS
D - AFTER 11 HOUR DRIFT
E - AFTER IMU REALIGNMENT

SUSIM-TO-ORBITER ALIGNMENT




SUSIM POINTING ERROR
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OF POOR QUALITY
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+.2
0.0
-.2
-.4
SUNRISE
NULL
SUNSET
0
5
10
15
20
25
30
35
40
45
50
TIME (minutes)