



SCALE
SCalable Asymmetric Lifecycle Engagement

2 – Radiation Environment Modeling Activity

ENGR-E 399/599

Microelectronics Radiation Effects and Reliability



THE AEROSPACE CORPORATION

**thanks to A. Boyd, Aerospace Corp. and the ARES
SEE Radiation Testing Program*

Activity Overview

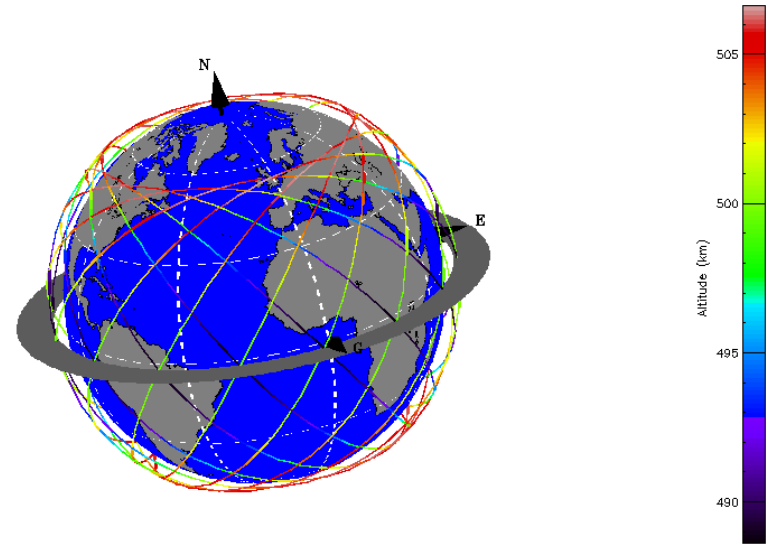


- **Using SPENVIS to generate some environment results for a few reference orbits**
- **Guided example for Mid-Latitude LEO (ex. ISS)**
 - Looking at trapped fluxes, dose-depth curves
- **On your own: generate environments for couple other orbits**
 - Walking around to help with issues and answer questions

Mid Latitude LEO (ISS, Starlink)

Mission Duration	10 years
Apogee	420 km
Perigee	420 km
Inclination	52.0 deg
RAAN ¹	0 deg
Argument of Perigee	0 deg
True Anomaly	0 deg

¹Right Ascension of the Ascending Node



On your own



- How do the environments at these orbits differ?

By yourself or in a small group, generate results for these other reference orbits

Polar LEO (POES, IIRIDIUM)	
Mission Duration	7 years
Apogee	825 km
Perigee	825 km
Inclination	98.8 deg
RAAN ¹	0 deg
Argument of Perigee	0 deg
True Anomaly	0 deg

¹Right Ascension of the Ascending Node

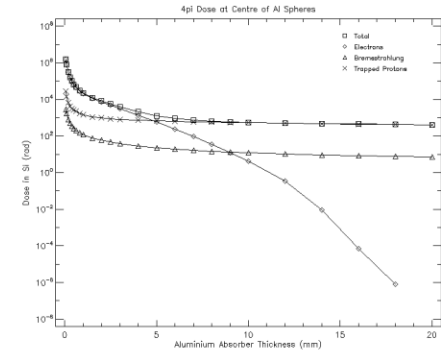
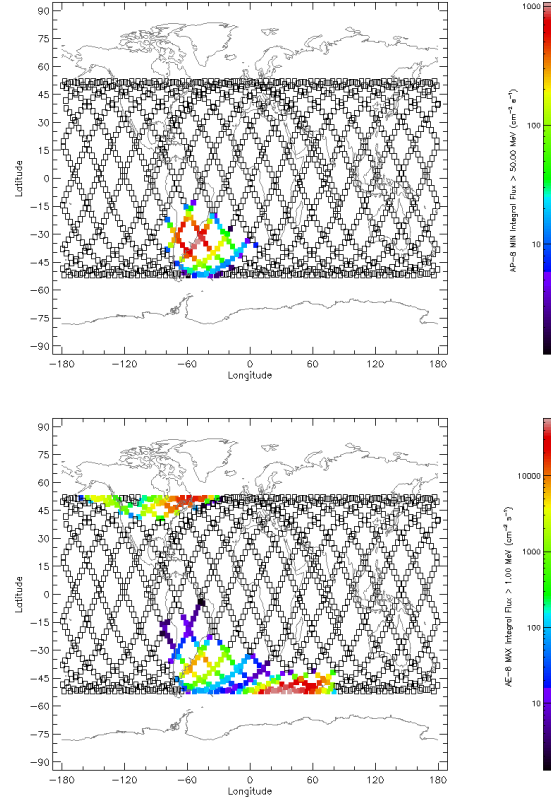
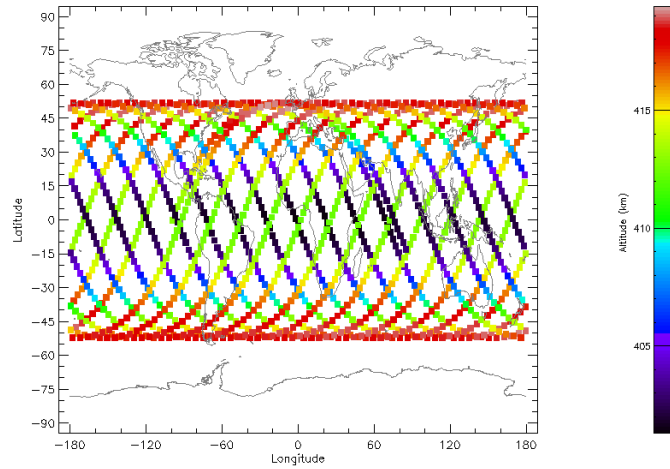
HEO (Van Allen Probes, MMS)	
Mission Duration	2 years
Apogee	70000 km
Perigee	2500 km
Inclination	28 deg
RAAN	0 deg
Argument of Perigee	0 deg
True Anomaly	0 deg

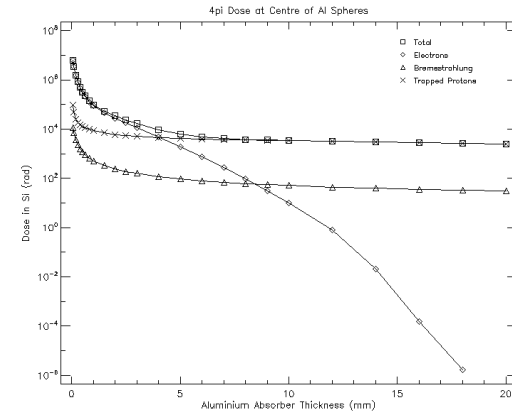
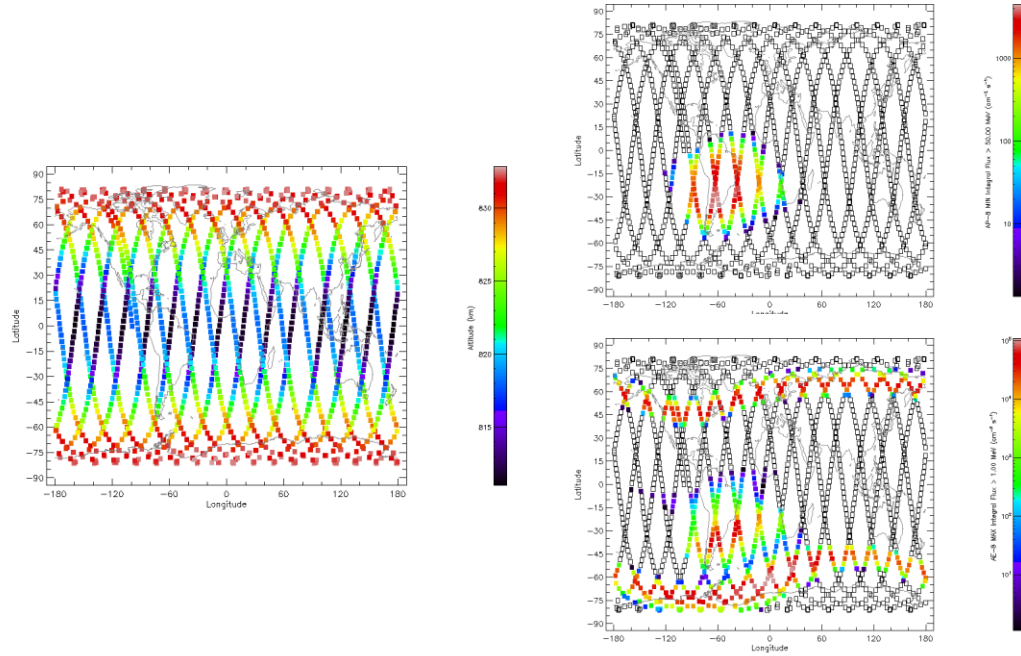


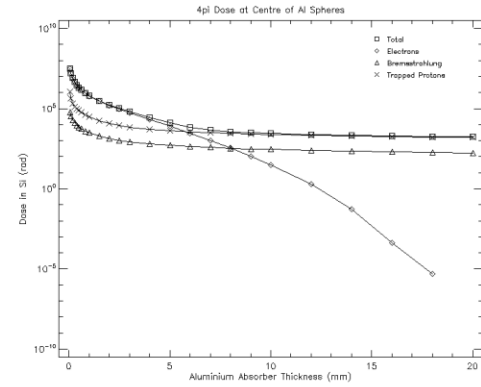
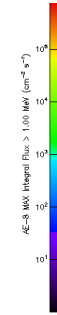
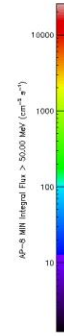
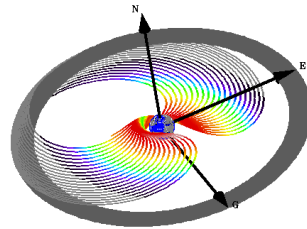
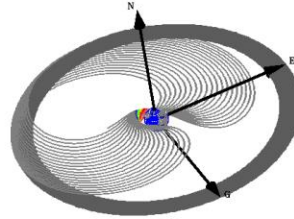
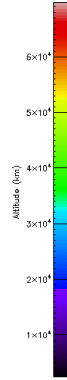
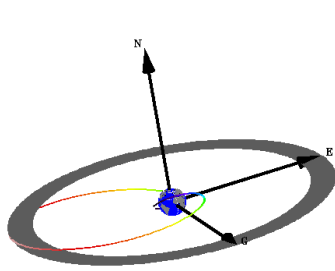
Backup



Mid Latitude LEO









Thank you

