Trevor
Leonard
NOAA
Poster
The Magnetospheric Particle Sensor - Low Energy (MPS-LO) is NOAA’s first plasma instrument on a Geostationary Operational Environmental Satellite (GOES) measuring 30 eV - 30 keV ions and electrons. MPS-LO observations can help identify spacecraft surface charging which is associated with thermal particle populations, <50 keV electrons. Electrostatic discharge due to spacecraft charging is the leading cause of environmentally related anomalies on spacecraft and has caused the most serious anomalies which have resulted in the loss of mission. MPS-LO is an electrostatic analyzer (ESA) with 15 logarithmically spaced energy steps and microchannel plates (MCP) serve as the detection elements. Each energy step accumulates observations over 0.0615 sec while the ESA cycles through all 15 energy steps every second. Each angular zone has a 15° x 5° field of view (FOV) and all 12 unique angular zones combined in a fan along the north-south plane pointing anti-Earthward provide a total field of view (FOV) of 180° x 5°. Ground processing algorithms remove backgrounds and calculate the pitch angle of each angular zone using the magnetic field vector measured by the GOES-R Magnetometer (MAG or GMAG). MPS-LO is a part of the Space Environment In Situ Suite (SEISS) which also includes the particle detectors: MPS-HI, SGPS, and EHIS, to measure plasma properties and energetic particle populations at geosynchronous orbit. We will discuss the MPS-LO instrument operation, the necessary data processing and removing background observations, and how MPS-LO identifies spacecraft charging.

Poster category:

Poster category
Geospace/Magnetosphere Research and Applications
Meeting homepage
Space Weather Workshop 2023
Download to PDF