ASTRONUM 2018
POSTER ABSTRACTS

Colson, Andrew	***Statistical Analysis and Modeling of Record Ionosphere and Auroral Electron Spacecraft Charging Events*** Andrew Colson, NASA MSFC The Defense Meteorological Satellite Program (DMSP) spacecraft are a series of low-earth orbit (LEO) satellites whose mission is to observe the space environment using the precipitating energetic particle spectrometer (SSJ/4). DMSP satellites fly in a geosynchronous orbit at ~840 km altitude which passes through Earth's ionosphere. Satellites in LEO, such as DMSP, experience episodically charging events to frame potentials in the kilovolt range when exposed to space weather environments characterized by a high flux of energetic (~10's kilovolt) electrons in regions of low background plasma density. Statistical analysis of a set of extreme DMSP charging events are described varying in maximum negative frame potential from ~0.6 kV to ~2 kV which surpasses the highest recorded voltage in all previous studies. The goal is to focus on the characteristics of the charging events to understand how space weather impacts both spacecraft design and operations for vehicles on orbital trajectories that traverse auroral charging environments.