

Temporal Evolution of the Plasma Sheath Surrounding Solar Cells in Low Earth Orbit

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High voltage solar array interactions with the space environment can have a significant impact on array performance and spacecraft charging. Over the past 10 years, data from the International Space Station has allowed for detailed observations of these interactions over long periods of time. Some of the surprising observations have been floating potential transients, which were not expected and are not reproduced by existing models. In order to understand the underlying processes producing these transients, the temporal evolution of the plasma sheath surrounding the solar cells in low Earth orbit is being investigated. This study includes lumped element modeling and particle-in-cell simulation methods. This presentation will focus on recent results from the on-going investigations.