

Tethered Satellites as Enabling Platforms for an Operational Space Weather Monitoring System

Space weather nowcasting and forecasting models require assimilation of near-real time (NRT) space environment data to improve the precision and accuracy of operational products. Typically, these models begin with a climatological model to provide "most probable distributions" of environmental parameters as a function of time and space. The process of NRT data assimilation gently pulls the climate model closer toward the observed state (e.g. via Kalman smoothing) for nowcasting, and forecasting is achieved through a set of iterative physics-based forward-prediction calculations. The issue of required space weather observatories to meet the spatial and temporal

requirements of these models is a complex one, and we do not address that with this poster. Instead, we present some examples of how tethered satellites can be used to address the shortfalls in our ability to measure critical environmental parameters necessary to drive these space weather models. Examples include very long baseline electric field measurements, magnetized ionospheric conductivity measurements, and the ability to separate temporal from spatial irregularities in environmental parameters. Tethered satellite functional requirements will be presented for each space weather parameter considered in this study.