A Comparison of the *Ovation Prime* Auroral Prediction Model to the NOAA POES Auroral Activity Model

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The POES (Polar Operational Environmental Satellite) Auroral Model provides auroral information to many people who want to know when they can see the aurora through its SWPC webpage. This model is based on data from the NOAA POES spacecraft in polar Low-Earth-Orbit (LEO).The POES satellites measure the auroral particles at every pass through the auroral zone. With six satellites, the aurora is sampled on average about once every 12 minutes however, the data are only sent down to one of two ground stations so the data are 30 to 90 minutes old by the time it reaches SWPC. . The Ovation Prime model is an empirical model based on the DoD DMSP spacecraft and is driven by solar wind data detected by the ACE satellite. Thus, it is able to provide a 30-40 minute forecast of the aurora. Because the Ovation Prime model can provide a forecast, it would be much more useful to customers. The focus of this project is to identify the differences between the current POES auroral product and the new Ovation Prime Model and subsequently assess whether they will provide comparable information. Both models provide estimates of the Hemispheric Power (HP) which is the total energy deposited by the aurora into the upper atmosphere and ionosphere in the northern or southern polar regions. Comparison of the POES and Ovation (HP) were made for 10 different time periods between October 2003 and March 2012. Initial comparisons showed that while both models captured geomagnetic storms, the POES HP had much more variability than the Ovation HP indicating that POES HP might be capturing substorms whereas the Ovation HP only captured the geomagnetic storm. To improve comparisons and remove the substorm variations, the POES HP data were smoothed with a 2 hour smoothing function.. For each POES HP value, the coinciding Ovation Prime HP were interpolated to the time corresponding with the POES data points. The Ovation Prime data was then plotted as a function of the POES data. The Pearson correlation coefficient and the equation of the line were calculated for each event and compared to others. Questions that were considered included when and where the differences occurred and whether or not a consistent difference occurred that could be later accounted for in the Ovation Prime model. In this presentation I will discuss in more detail how the results were obtained, the types of time periods examined and more specifically the correlation between POES and Ovation Prime.