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The dayside superfountain effect: Observations and modeling

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The resultant effects of an eastward prompt penetration electric field (PPEF) at the dayside equator is a plasma superfountain. We will examine the "Halloween" October 30, 2003 superstorm event PPEF and resultant superfountain features. Observations from satellite vertical TEC and ground based TEC data will be used to illustrate some of the many features of this phenomenon. A method to obtain the amplitude and time variations of the PPEF in the ionosphere will be reviewed and will be applied to derive the October 30, 2003 TEC for the first 2 hrs of the event. This derived electric field will then be used as an input to the modified NRL SAMI2 ionospheric code (SAMI2*). The simulated electron content results will be directly compared to CHAMP satellite TEC results. Predictions of ion uplift will also be obtained and discussed as well. This will be the first attempt to quantitatively compare computer simulation results and satellite TEC data. Successes and shortcomings of the comparisons will be discussed. If time permits, further facets of the dayside superfountain will be explored.