Observations of Large Scale Earthward Poynting Fluxes well within Plasmasheet, down to L=~3, during Major Geomagnetic Storms

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Polar observations of earthward directed Poynting flux associated with Alfven waves at altitudes of ~4−6 R_E along with their relation to local electron acceleration, auroral emission and FAST observations, at and below ~1 R_E, of intense broadband electrons and associated kinetic Alfven waves have been well studied in the cusp and plasmasheet boundary layer (PSBL) regions. We describe events, which appear similar to those at the cusp and PSBL, but occur instead well within the plasmasheet, down to L=~3, which occur during major geomagnetic storms. DC electric and magnetic field data from Polar at ~2 R_E altitude indicate earthward dc Poynting fluxes of up to 20 ergs/cm^2−s with durations of ~5−20 minutes. These dc fluxes coincide with shorter time scale bursts of Alfvanic Poynting flux of up to a few ergs/cm^2−s and intense electrons at Polar, similar to those previously seen at the cusp and PSBL. The times of these dc fluxes also coincide with times of intense earthward directed broadband electrons observed by FAST in pseudo−conjunction with Polar. We will discuss evidence for Alfvenic acceleration of broadband electrons during major geomagnetic storms. We will also examine alternate mechanisms including the Kennel−Petschek one using Polar wave data obtained in the inner magnetosphere.