



## **Characteristics of the dipolarization front associated with two auroral activations of Feb. 16, 0220 UT, 2008 substorm**

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We present the plasma sheet flow and field disturbance associated with two poleward/equatorward auroral expansion starting around 0216 UT and 0243 UT on 16 Feb 2008, when the five THEMIS spacecraft were distributed in the pre-midnight to midnight (22-24 MLT) region between 8 and 18 RE downtail. In this paper we report the dipolarization signatures observed at the THD(P3) and THE(P4) spacecraft at downtail distances between 8 and 10 RE. The two events had different current sheet configuration and the downtail distance of possible X-line was different based on the five THEMIS magnetic field profile. During the 0216 UT event THD(P3) and THE(P4) were located in a thin near-Earth current sheet and detected a clear dipolarization front accompanied by fast flows and strong shear in the magnetic field and the flows suggesting upward field aligned current. During the 0243 UT event, dipolarization was observed at THD(P3) and THE(P4) but in a thicker plasma sheet and started with the opposite sense of flow shears followed by more localized shear structures in the fields and flows compared to the 0216 event. We discuss these different types of dipolarization front in terms of different stages of the fast flows interacting with the ambient field and consequent signatures of auroras.