How does the dipolarization propagate between the ETS-VIII and Michibiki-1 satellites?

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There are some studies about the direction of propagation of magnetic field dipolarization in the magnetosphere. Nagai [1982] first reported that the dipolarization propagates longitudinally, using data from the geosynchronous GOES-2 and -3 satellites. Jacquey et al. [1991] and Ohtani et al. [1992] found tailward propagation from analysis of the ISEE-1 and -2 data, while Ohtani et al. [1998] showed earthward propagation from simultaneous observations by the AMPTE/CCE and GOES-5, -6 and -7 satellites.

We revisit this topic, using the magnetic field data from the ETS-VIII and Michibiki-1 satellites. ETS-VIII is the geosynchronous satellite and Michibiki-1 is the quasi-zenith satellite; both are flying over Japan. These two satellites have been operated simultaneously from September 20th, 2010 until December 18th, 2016. This unique pair of satellites will find a lot of events of dipolarization that are suitable to estimate the propagation direction and velocity. First we detect possible dipolarization events from the ETS-VIII data, according to the following two criteria: (1) the north-south component of the magnetic field is increased by more than 50 nT within 20 min and (2) the event is accompanied with the decrease of the AL index. These criteria yield 256 events. Then, they are classified into three types: Type-1 includes dipolarization events that are detected by both ETS-VIII and Michibiki-1; type-2 includes event, in which dipolarization signature is detected only by ETS-VIII and not by Michibiki-1; and type-3 does not appears to be dipolarization. In presentation, we will focus on type-1 and type-2 events, and introduce analysis results.

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