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# Van Allen Probes observations of dipolarization and ion acceleration in the inner magnetosphere

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Recent study employing the MDS-1 satellite reveals that magnetic field dipolarization in the deep inner magnetosphere is not uncommon. When the MDS-1 satellite was located at L=3.0-6.5 near the auroral onset longitude (MLT difference of $\leq$2.5 h), the occurrence probability of local dipolarization was 25%. Surprisingly, an event was found at L$\sim$3.6, far inside the geosynchronous altitude. When dipolarization was found at L=3.5-5.0, magnetic storms were developing. This implies that it is difficult to find dipolarization signatures in the deep inner magnetosphere during a nonstorm period.

We study magnetic field dipolarization and associated ion acceleration in the deep inner magnetosphere, using magnetic field and ion flux data obtained by the Van Allen Probes. First, from the magnetic field data recorded on the nightside (1800-0600 MLT) we selected candidate events in which the magnetic field in the component antiparallel to the dipole axis (i.e., H component in VDH coordinates) increases by more than 20 nT in 5 minutes. Second, the candidate events were scanned visually to confirm if they are accompanied by magnetic fluctuations. Finally, the geomagnetic AL, ASY, and Wp indices were examined to ensure that substorm activity was registered around the candidates events. These procedures yield 96 dipolarization events from 1 October 2012 to 31 October 2013. We find that dipolarization mostly occurs at L=4.5-6.5 before midnight (2100-0000 MLT). Some events are accompanied by $O^+$ flux enhancements in the energy range of 1-10 keV, which is consistent with the AMPTE/CCE CHEM observation reported by Nosé et al. [2014]. We will discuss possible mechanisms of the selective acceleration of $O^+$ ions in the inner magnetosphere during dipolarization.