



Dipolarization, current sheet flapping motion and periodic particle flux enhancements observed during the Galaxy 15 spacecraft anomaly

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On 5 April 2010, the Galaxy 15 spacecraft, orbiting at geosynchronous altitudes experienced an anomaly near local midnight when it stopped responding to any ground commands. Galaxy 15 spacecraft encountered severe plasma conditions while it was in eclipse and during the subsequent anomaly interval and these conditions included a massive magnetic field dipolarization that injected energetic particles from the magnetotail during a substorm. This anomaly was interesting for many reasons including that multiple spacecraft (GOES and THEMIS probes) were well located in the nightside to observe the substorm. At the time of the field line stretching and dipolarization some of the satellites observed magnetic variations together with particle flux enhancements with periodicities of a few minutes. In this study, we detail characteristics of this dipolarization, which was one of the strongest ever observed by a GOES spacecraft, as well as discuss perturbations in the magnetic field and particle fluxes that are indicative of magnetotail current sheet flapping motion.