A space-based proxy for the Dst index

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Abstract: [1] The Dst index was created to monitor and quantify disturbances in the inner magnetosphere using ground-based, magnetic field measurements. The phases and strengths of geomagnetic storms are usually defined by the evolution of Dst. The standard Dst database is computed and maintained at the World Data Center for Geomagnetism, Kyoto. We demonstrate that the Dst index can also be approximated using magnetometers on spacecraft in near-Earth orbit. Measurements used in the demonstration were obtained from boom-mounted sensors on two spacecraft of the Defense Meteorological Satellite Program. The extraction technique can be applied to magnetic field data retrieved by magnetometers on any spacecraft in low Earth orbit. This alternate method for computing a Dst-like index can be used to (1) supplement the standard Dst index in near-real-time space weather applications and (2) replace the "prompt" Dst index during intervals of unavailability. Copyright 2007 by the American Geophysical Union.

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