The STEREO/IMPACT magnetic field experiment

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Abstract: The magnetometer on the STEREO mission is one of the sensors in the IMPACT instrument suite. A single, triaxial, wide-range, low-power and noise fluxgate magnetometer of traditional design-and reduced volume configuration-has been implemented in each spacecraft. The sensors are mounted on the IMPACT telescoping booms at a distance of ~3 m from the spacecraft body to reduce magnetic contamination. The electronics have been designed as an integral part of the IMPACT Data Processing Unit, sharing a common power converter and data/command interfaces. The instruments cover the range ±65,536 nT in two intervals controlled by the IDPU (±512 nT; ±65,536 nT). This very wide range allows operation of the instruments during all phases of the mission, including Earth flybys as well as during spacecraft test and integration in the geomagnetic field. The primary STEREO/IMPACT science objectives addressed by the magnetometer are the study of the interplanetary magnetic field (IMF), its response to solar activity, and its relationship to solar wind structure. The instruments were powered on and the booms deployed on November 1, 2006, seven days after the spacecraft were launched, and are operating nominally. A magnetic cleanliness program was implemented to minimize variable spacecraft fields and to ensure that the static spacecraft-generated magnetic field does not interfere with the measurements.
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