

STEREO in-situ data analysis

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STEREO's IMPACT (In-situ Measurements of Particles and CME Transients) investigation provides the first opportunity for long duration, detailed observations of 1 AU magnetic field structures, plasma and suprathermal electrons, and energetic particles at points bracketing Earth's heliospheric location. The PLASTIC instrument will make plasma ion composition measurements completing STEREO's comprehensive in-situ perspective. Stereoscopic/3D information from the STEREO SECCHI imagers and SWAVES radio experiment will make it possible to use both multipoint and quadrature studies to connect interplanetary Coronal Mass Ejections (ICME) and solar wind structures to CMEs and coronal holes observed at the Sun. The uniqueness of the STEREO mission requires novel data analysis tools and techniques to take advantage of the mission's full scientific potential. An interactive browser with the ability to create publication-quality plots is being developed which will integrate STEREO's in-situ data with data from a variety of other missions including WIND and ACE. Also, an application program interface (API) will be provided allowing users to create custom software that ties directly into STEREO's data set. The API will allow for more advanced forms of data mining than currently available through most data web services. A variety of data access techniques and the development of cross-spacecraft data analysis tools will allow the larger scientific community to combine STEREO's unique in-situ data with those of other missions, particularly the L1 missions, and, therefore, to maximize STEREO's scientific potential in gaining a greater understanding of the heliosphere.