



Tools for STEREO in-situ data analysis

P. Schroeder (1), J.G. Luhmann (1), A. Davis (2), C.T. Russell (3), A. Szabo (4) and T. Narock (4)

(1) Space Sciences Laboratory, University of California, Berkeley, USA, (2) California Institute of Technology, USA, (3) University of California, Los Angeles, USA, (4) Laboratory for Extraterrestrial Physics, NASA Goddard Space Flight Center, USA

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. New visualization tools are being created by the IMPACT team utilizing the HELIOS, IMP-8, and ISEE3 data sets as proxies for the STEREO and L1 missions. STEREO is one of the first missions to be developed since the formation of the Virtual Heliospheric Observatory (VHO) and will serve as a testbed for many of the VHO's concepts, particularly the role that the VHO can play in facilitating the integration of data derived from disparate heliospheric missions. To that end, the IMPACT team is developing both human-friendly web portals and API's (application program interfaces) which will allow the VHO and the other VxO's access to STEREO's in-situ data sets. The 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.