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An heliospheric propagation model for solar wind prediction at planets

A. Goutenoir (1), M. Bouchemit (1), E. Budnik (2), C. Tao (3), N. André (1), and V. Génot (1)

(1) IRAP, CNRS-UPS, 9 avenue du colonel Roche, 31028 Toulouse, France; (2) Noveltis, Ramonville Saint Agne, France; (3) National Institute of Information and Communications Technology, Tokyo, Japan (nicolas.andre@irap.omp.eu / Fax: +33-5-61-55-83-70)

Abstract

Under Horizon 2020, the Europlanet 2020 Research Infrastructure (EPN2020-RI, http://www.europlanet-2020-ri.eu) includes an entirely new Virtual Access Service, "Planetary Space Weather Services" (PSWS) that will extend the concepts of space weather and space situational awareness to other planets in our Solar System and in particular to spacecraft that voyage through it.
PSWS will provide at the end of 2017 12 services distributed over 4 different service domains – 1) Prediction, 2) Detection, 3) Modelling, 4) Alerts. **These services include in particular an heliospheric propagator for solar wind prediction at planets and probes that is based on a 1D magnetohydrodynamic propagation model originally developed by Tao et al. (2005)**. The service gives access to various propagated parameters including solar wind density, temperature, velocity, dynamic pressure, and tangential magnetic field. The present paper will first describe the solar wind propagation model, and then present the system architecture developed by the Space Plasma Physics Data Center (http://www.cdpp.eu) in France in order to make the service operational (http://heliopropa.irap.omp.eu).
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References

Tao, C. et al., Magnetic field variations in the Jovian magnetotail induced by solar wind dynamic, Journal of Geophysical Research: Space Physics, 110, A11208, 10.1029/2004JA010959, 2005