EPSC Abstracts
Vol. 12, EPSC2018-27, 2018
European Planetary Science Congress 2018

Planetary SpaceWeather Services for the Europlanet 2020 Research Infrastructure

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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 2018 12 services distributed over 4 different service domains – 1) Prediction, 2) Detection, 3) Modelling, 4) Alerts. These services include **1.1) A 1D MHD solar wind prediction tool**, **1.2) Extensions of a Propagation Tool**, **1.3) A meteor showers prediction tool, 1.4) A cometary tail crossing prediction tool, 2.1) Detection of lunar impacts, 2.2) Detection of giant planet fireballs, 2.3) Detection of cometary tail events, 3.1) A Transplanet model of magnetosphere-ionosphere coupling, 3.2) A model of the Mars radiation environment, 3.3.) A model of giant planet magnetodisc, 3.4) A model of Jupiter's thermosphere, 4) A VO-event based alert system.** We will provide an overview of the project as an introduction to the session where some of them will be detailed.
The proposed Planetary Space Weather Services will be accessible to the research community, amateur astronomers as well as to industrial partners planning for space missions dedicated in particular to the following key planetary environments: Mars, in support of ESA's ExoMars missions; comets, building on the success of the ESA Rosetta mission; and outer planets, in preparation for the ESA JUpiter ICy moon Explorer (JUICE). These services will also be augmented by the future Solar Orbiter and BepiColombo observations. This new facility will not only have an impact on planetary space missions but will also allow the hardness of spacecraft and their components to be evaluated under variety of known conditions, particularly radiation conditions, extending their knownflight-worthiness for terrestrial applications.
Europlanet 2020 RI has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654208.