



## **IMPEX - a web-based distributed research environment for planetary plasma science**

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The FP7-SPACE project IMPEX (<http://impex-fp7.oeaw.ac.at/>) was established to provide a web-based infrastructure to facilitate the inter-comparison of spacecraft in-situ measurements and computational models in the fields of planetary plasma science. Within this project several observational (CDAWeb, AMDA, CLWeb), as well as numerical simulation (FMI, LATMOS, SINP) databases provide datasets, which can be combined for further joint analysis and scientific investigation. The major goal of this project consists in providing an environment for the connection and joint operation of the different types of numerical and observational data sources in order to validate numerical simulations with spacecraft observations and vice versa.

As an important milestone of IMPEX a common metadata standard was developed for the description of the currently integrated simulation models and the archived datasets. This standard is based on the SPASE data model (DM), which originates from the Heliospheric physics community. This DM was developed for the description of observational data, and that is why it was chosen as a basis within the scope of IMPEX. A considerable part of the project effort is dedicated to the development of standardized (web service-) interfaces and protocols using the SPASE DM as an elaborated IMPEX DM for the communication between the different tools and databases of the IMPEX research infrastructure.

For the visualization and analysis of the archived datasets available within IMPEX and beyond, several tools (AMDA, 3DView, CIWeb) were upgraded to be able to work with the newly developed metadata standards and protocols. A practical example will be presented to demonstrate the capabilities and potentials of the achievements of IMPEX by using these tools. Furthermore the IMPEX DM has by now also been successfully applied outside the project's core infrastructure: A prototype for UCLA MHD description can be seen at LatHyS. Besides that IRAP is currently working on a demonstrator for accessing CCMC simulations based on the IMPEX DM.

Recent evaluations within the project team have shown that besides of the set of project tools the need for a single dedicated entry point will enhance the usability of the integrated research infrastructure, developed by IMPEX. For that reason the so-called 'IMPEX portal' is currently built up to make the advantages of the applied IMPEX standards efficiently used for the benefit of the broad scientific community and general public. Along with that, the scientific / professional 'IMPEX portal' will provide an additional entry point for educational and dissemination purposes. This presentation will give an insight on the technological challenges of distributed data infrastructures and their future in cloud-based environments.