

The IMPEX Protocol – building bridges between scientific databases and online tools

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Abstract

The **FP7-SPACE project IMPEX** (<http://impex-fp7.oeaw.ac.at>) was established as a result of scientific collaboration between research teams from **Austria, Finland, France, and Russia**, working on the integration of a set of data mining, analysis and modeling tools in the field of **space plasma and planetary physics**. The primary goal of the project is to **bridge the gap** between **spacecraft measurements** and up-to-date **computational models** of planetary environments, enabling their joint operation for a better understanding of related physical phenomena.

The **IMPEX Protocol** constitutes one of the cornerstones of the integration effort. While the **IMPEX Data Model** assures that the information exchanged can be ‘understood’ and hence processed by every participating tool or database system, the protocol provides the means to **leverage specific functionalities** of the respective host system in conjunction with the data provided. Examples thereof would be services for **calculating field lines** and **particle**

trajectories, on-the-fly modeling runs with specific parameters and so forth. Additionally there are also **utility methods** available that allow to e.g. access specific data files or support search interfaces by providing ranked lists of stored modeling runs for a given set of (upstream) parameters.

The presentation offers an **overview of the IMPEX protocol** and addresses the motivation for some of the (technical) **design decisions** taken during the development process. Further the resulting **SOAP based web service interface** is discussed and individual services and their applications are addressed specifically. Last but not least the **first available implementations** of the protocol are presented and a brief overview of tools already leveraging the IMPEX protocol is provided. The presentation closes with an outlook on possible future applications as well as extensions of the IMPEX protocol, including information on how to get started when implementing the IMPEX protocol, in order to **join the growing community of IMPEX** enabled online systems and tools.

