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Theoretical VO: description of models and simulations in IMPEx

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Abstract

We present here the developments realized within the IMPEx FP7 project (http://impex-fp7.oeaw.ac.at/) which aims at connecting simulation databases to tools developed for observational databases. We particularly focus on the standardized descriptions and methods we developed that allow the tools to efficiently retrieve and/or require data.

1. Introduction

The virtual observatories provide both access to astronomical data and tools that can analyze them. The VO efforts first aimed at providing access to observations realized by telescopes and spacecraft. It is now in the process of providing access to simulation models and results too.

The IMPEx (Integrated Medium for Planetary Exploration) FP7 project is born in this perspective. It links tools that can access standard observational database and analyses their data to simulation databases. We hereafter present the standardized description language (DataModel) and methods we developed that allow the tools to efficiently retrieve and/or require data.

2. IMPEx Simulation DataModel: an extension to SPASE

In order for the tool to retrieve informations, the latter must be accompanied by metadata describing the data content, both in term of format and of physical meaning. This description must be simple and precise enough to be "understood" by a tool. The language in which the description is written is called a data model.

Several data models exist that allow to describe observational data, but none simulated data. In particular since simulated metadata should also include a description of the model inputs (which are also data of some sort).

We thus developed such a data model that we will present here. This model extends the SPASE (observational) data model (http://spase-group.org) which is well fitted to the Space Physics domain targeted by IMPEx. We also briefly compare it to the IVOA SimDM model (http://votheory.obspm.fr).

3. IMPEx APIs: requiring post-processing or simulation runs

Simulation data differs from observational data by the fact that they can be re-generated by a post-processing method or by the simulation model itself with new input parameters. IMPEx provides to the tools the ability to require such data generation through the use of standard APIs that will be presented.

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