Europlanet-RI IDIS – Virtual Observatory for Planetary Research

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The Integrated and Distributed Information Service IDIS [1] of the "Europlanet Research Infrastructure - Europlanet RI", an EU Framework Program 7 activity, will provide in the future access to a wide range of planetary science data and relevant support information for planetary research. The challenge is the diversity of research fields involved in planetary research, each with its own way of collecting and archiving data and publishing its results. Nevertheless the results of one field are needed by others to be able to correctly interpret their observations, and to design new kinds of measurements to advance our knowledge of the Solar system. Example: The interpretation of planetary surface material data collected by space-borne remote sensing instruments needs the information about the planetary atmosphere's absorption behaviour which in turn is influenced by the status of the planet's ionosphere and the Solar activity.

A generalized IDIS data model has been developed for the IDIS Virtual Observatory (IDIS-VO) to register and access data from planetary data centres, laboratory measurements, spectral- and molecular data bases and simulations. Once a data set from any of these sources is registered with IDIS, it can be accessed, its used archive format translated into a compatible internal format and combined with other data using the visualization tools developed in connection with IDIS.

During the development phase of the VO, IDIS team member worked in close cooperation with representatives of ESA's Planetary Science Archive (PSA), NASA's Planetary Data System (PDS), and the International Planetary Data Alliance (IPDA), taking the new developments into account. The Planetary Data Access Protocol (PDAP) defined by the IPDA frame is still under development and a strong candidate for the final IDIS implementation, though alternatives like the astronomy-oriented IVOA protocol might be available, too. First test implementations are already available for space plasma data at the IDIS network plasma-node in Toulouse (Automated Multi Dataset Analysis AMDA at CESR in Toulouse) [2]. Among other features AMDA allows to follow Solar events through the solar system taking travel times into account when correlating measurements in the vicinity of different planets. Another test implementation can be found at the IDIS node for Planetary Dynamics and Extraterrestrial Matter in Paris [3].

By the end of the project in 2012 data from most planetary missions can be accessed, combined and correlated with spectral data bases for atmospheric gases and solids, laboratory measurements related to space observations and the results of model runs simulating the observations of different parameters around and at planets under various boundary conditions. The VO-structure will allow the access to these data through graphical interfaces including optimized visualization tools or alternatively through a command interface for further integration into other applications.

Combining the area of expertise with information from less well known background in a comprehensive way will allow the researcher to detect unknown features in the data, to set reasonable boundary conditions for detailed analysis and to get into contact with colleagues from outside her/his direct field of experience who might provide support in a research project. IDIS also provides access to information about institutes, test facilities and potential co-operation partners.

Reference:

[1] Details to IDIS and the Europlanet-RI via Web-site: http://www.idis.europlanet-ri.eu/
[2] Demonstrator implementation for Plasma-VO AMDA: http://cdpp-amda.cesr.fr/DDHTML/index.html
[3] Demonstrator implementation for the IDIS-VO: http://www.idis-dyn.europlanet-ri.eu/vodev.shtml