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Interoperable Delivery of Global Planetary Datasets in the Internet

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Introduction: The growing number of high-resolution planetary map datasets causes increased needs for sophisticated visualisation and comparison tools. The service-based concept of the *Open Geospatial Consortium* (OGC) [1] is a fundamental trend away from monolithic GIS systems towards distributed interoperable services. We want to examplarily show techniques to deliver HRSC and SRC data based on OGC's standards and therewith greatly enhance its usage both for science and public outreach. These techniques could find one's way into the collaborative *European Planetary Mapping Programme* submitted as a proposal to EU's *Seventh Research Framework Programme* by various research groups – amongst others, the Free University of Berlin, the German Aerospace Center, the Technical University of Berlin, the Unversity College London and the European Space Agency.

Motivation: The aim here is to show the necessary steps to process global mosaics of HRSC's Martian image data and develop a prototype of an interoperable data serving system which would be accessible through a website and OGC-defined Web Map Service (WMS) connections. As many mapserver applications only support earth-based coordinate reference systems, possible adaptions as proposed by T. Hare et al. [2] will be shown on the poster. Using these techniques, it is possible to overlay HRSC/SRC mosaics with other Martian WMS data e.g. MOC, THEMIS and MOLA. These layers are provided by the map services OnMars [3] and Map-a-Planet [4]. As many applications on the market are equipped with WMS capable interfaces, plenty of already available tools can be applied on the data.

Approach: Adequate images of HRSC respectively SRC are selected from a geospatial database system, brought to a common map scale, and combined to a global Mars mosaic using VICAR software routines developed at JPL and DLR. This mosaic is referenced on the planetary body using a *world file* to make it accessible by spatially-enabled applications. To handle the large amount of data represented by a single image layer, the raster file is split into a number of smaller images connected by a geometric index. Additionally, internal and external overviews are calculated, resulting in better display speeds for low resolution (global scale) as well as high resolution (image scale) map requests. The open source UMN MapServer [5] environment provides access to the data for web applications and OGC services and allows on-the-fly resampling into new projections. This way, the data sets are available for WMS-compliant mapping applications like NASA World Wind for e.g. three-dimensional realtime visualisation of the online datasets (using MOLA height data).

References: [1] OGC, http://www.opengeospatial.org/. [2] Hare, T. et al. (2006), LPSC XXXVII, abs. 1931. [3] JPL, http://onmars.jpl.nasa.gov/. [4] USGS, http://pdsmaps.wr.usgs.gov/. [5] ForNet/TerraSIP, http://mapserver.gis.umn.edu/