

## **MExLab Planetary Geoportal: 3D-access to planetary images and results of spatial data analysis**

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### **Abstract**

MExLab Planetary Geoportal was developed as Geodesy and Cartography Node which provide access to results of study of celestial bodies such as DEM and orthoimages, as well as basemaps, crater catalogues and derivative products: slope, roughness, crater density (<http://cartsrv.mexlab.ru/geoportal>). The main feature of designed Geoportal is the ability of spatial queries and access to the contents selecting from the list of available data set (Phobos, Mercury, Moon, including Lunokhod's archive data). Prior version of Geoportal has been developed using Flash technology. Now we are developing new version which will use 3D-API (OpenGL, WebGL) based on shaders not only for standard 3D-functionality, but for 2D-mapping as well. Users can obtain quantitative and qualitative characteristics of the objects in graphical, tabular and 3D-forms. It will bring the advantages of unification of code and speed of processing and provide a number of functional advantages based on GIS-tools such as:

- possibility of dynamic raster transform for needed map projection;
- effective implementation of the co-registration of planetary images by combining spatial data geometries;
- presentation in 3D-form different types of data, including planetary atmospheric measurements, sub-surface radar data, ect.

The system will be created with a new software architecture, which has a potential for development and flexibility in reconfiguration based on cross platform solution:

- an application for the three types of platforms: desktop (Windows, Linux, OSX), web platform (any

HTML5 browser), and mobile application (Android, iOS);

- a single codebase shared between platforms (using cross compilation for Web);
- a new telecommunication solution to connect between modules and external system like PROVIDE WebGIS (<http://www.provide-space.eu/progis/>).

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