Cartographical Aspects of Martian Moons Modeling

E. Grishakina (1), E. Lazarev (2), M. Lazareva (1)

(1) Lomonosov Moscow State University, Geographical, chair on Cartography and geoinformatics, Moscow, Russia; (2) Sternberg State Astronomical Institute, Lunar and Planetary Research, Moscow, Russia

Phobos orbits round about 9378 km from the center of Mars and Deimos – 23500 from the center of the planet. These celestial bodies have irregular shape and there are different ways to model their form and surface. Hypsometrical maps and three dimensional models are one of the most significant components of Solar System thematic cartography and result from digital terrain models (DTM) processing. They give possibilities to investigate different relief features, to develop space missions including landing on celestial bodies, and to find out space object origin and geology. It is important in popularization of space science and can be used in educational work.

We have created hypsometric map and 3D-models of the Martian satellites. The map of Phobos and Deimos hemispheres was compiled in orthographic projection at a scale 1:60 000. 3D-models of Martian satellites were created by extrusion the three-dimensional body from the sphere of a fixed radius according to elevation values from DEM. The special color height scale with the equal interval of 500 m was designed with respect to the real colors of the satellites' surface. Suggested techniques of mapping and modeling could be applied for any celestial body with irregular shape for that we have DEM with a determined precision.