The Phobos Information System

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We have developed a Geo-information system (GIS) for Phobos, based on data from the Mars Express and Viking Orbiter missions, which includes orthoimages, global maps, terrain- and gravity field models, all referenced to the Phobos coordinate system. The data are conveniently stored in the ArcGIS software system, which provides an environment for mapping and which allows us to carry out joint data analysis and miscellaneous data cross-comparisons. We have compiled catalogs of Phobos craters using manual and automated techniques, which includes about 5500 and 6400 craters correspondingly. While crater numbers are biased by available image data resolution and illumination, we estimate that our catalog of manually detected craters contains all Phobos craters >250 m which is a total of 1072 and catalog of automated detected craters are complete for craters >400 m (360 craters). Statistical analysis of these large craters reveals a surplus of craters on the anti-Mars hemisphere, whereas differences in crater abundance between leading and trailing hemisphere cannot be confirmed. Using terrain model information, we estimate the depths of 70 craters larger than 1 km.

We also have compiled catalogs of lineaments, and boulders. In particular, we mapped 546 individual grooves or crater chains, which extend in length from 0.3-16.2 km. We identified and determined the sizes and locations of 1379 boulders near crater Stickney. Cross-comparisons of gravity field models against distribution patterns of grooves and boulders are currently under way and may shed light on their possible origins. Finally, we have developed a Geo-portal, which allows the science community to conveniently search for, analyze, and download data of interest from our system. Additionally we provide access to color electronic maps (e-maps) with support for layers based on Phobos geodatabase and ArcGIS tools.