

**SOME FEATURES OF THE CRATERING OF ISIDIS BASIN.** J.A.Iluhina, A.V. Lagutkina, J.F.Rodionova. Sternberg State Astronomical Institute, Moscow University, [jeanna@sai.msu.ru](mailto:jeanna@sai.msu.ru)

Isidis basin is a round feature about 1500 km in diameter disposed in a transitional zone between continents and plains. It is between  $0^{\circ}$  -  $25^{\circ}$ N latitudes and  $260^{\circ}$  -  $285^{\circ}$  W longitude with the center in  $13.5^{\circ}$ N and  $272.6^{\circ}$ W. The bottom of the basin is deeper than -3.5 km [1]. The western slope passes to Syrtis Major Planum with the height about +2.0 km. The southern ridge of the basin is Libia Montes with the height +1 km and Nepenthes Fossae (parallel grabens with widths 10-15 km and length about 300 km). The north-western part is represented by Nilis Fossae (several parallel grabens with length about 900 km) [2]. The north-eastern part has no ridge: Isidis Planitia and Elysium planitia are divided by low wall with small strait.

It is interesting that there are great positive gravitational anomaly (as for round lunar maria - mascons) in Isidis basin with the center about  $12^{\circ}$ N and  $271^{\circ}$ W and abundance mass equal  $5.1 \times 10^{20}$  gramm [3].

Isidis basin is a beautiful place for the investigation by space vehicles because there are a lot of interesting features there. For example the fluidized craters are on the bottom of the basin so as on the western slope and on Syrtis Major Planum although the difference in the height level of the bottom of Isidis basin (-3.5 - -4 km) and Syrtis Major Planum (+1.5 - +2 km) is more than 5 km.

Presence of craters with fluidized deposits serves as a parameter of opening of rocks with ice. Depth of the minimal crater on the size with similar deposits in this or that area represents actually an estimation of depth a roof of frozen rocks or capacity of a superficial layer of frosty rocks [4]. Average depth of frozen rocks at

the latitude of Isidis basin makes 300-350 m.

We count up density of distribution of craters in diameter of 1 km and more, located at the bottom of Isidis basin, on the western slope with difference of heights of 4.5 km and on a plateau. Craters with fluidized emissions are separately investigated.

The average density of craters of this size at the bottom of basin has made 1441 crater on the area in 1 million square kilometers. On a slope the density of craters has made 2154 while on a plateau 2141 crater. Craters with fluidized deposits at the bottom of the basin have made 34 %, on a slope of 21 %, and on a plateau of 60 %. The ratio of diameter of deposits to diameter of craters is change from 1.4 to 2.5 in the bottom of basin, from 1.6 to 3.1 on the slope and from 1.9 to 3.7 on the plateau. The fluidized deposits on Syrtis Major Planum are preserved not very well and looks like buried by dust and sand.

Fig.1 represents the density distribution of craters in the bottom of Isidis basin, on the slope and on plateau. The density of craters in diameter 1-2 km is more on the slope than on the plateau. Fig.2 represents a part of Photomap used for the measurement.

References:

- [1] Iluhina J.A., Rodionova J.F. (2002) *Automated making of the map of Isidis basin. Abstracts of 36 microsymp. Brown-Vernadskiy* [2] Nikishin A.M (1987) *Geologicheskoe stroenie i evolutsiya Marsa. Ed. Moscow University.* [3] Sjogren W.L. (1979) *Abstract of Second Intern. Colloquium on Mars. NASA, p.75.* [4] Kuzmin R.O. (1983) *Kriolitosphera Marsa. Moscow.*

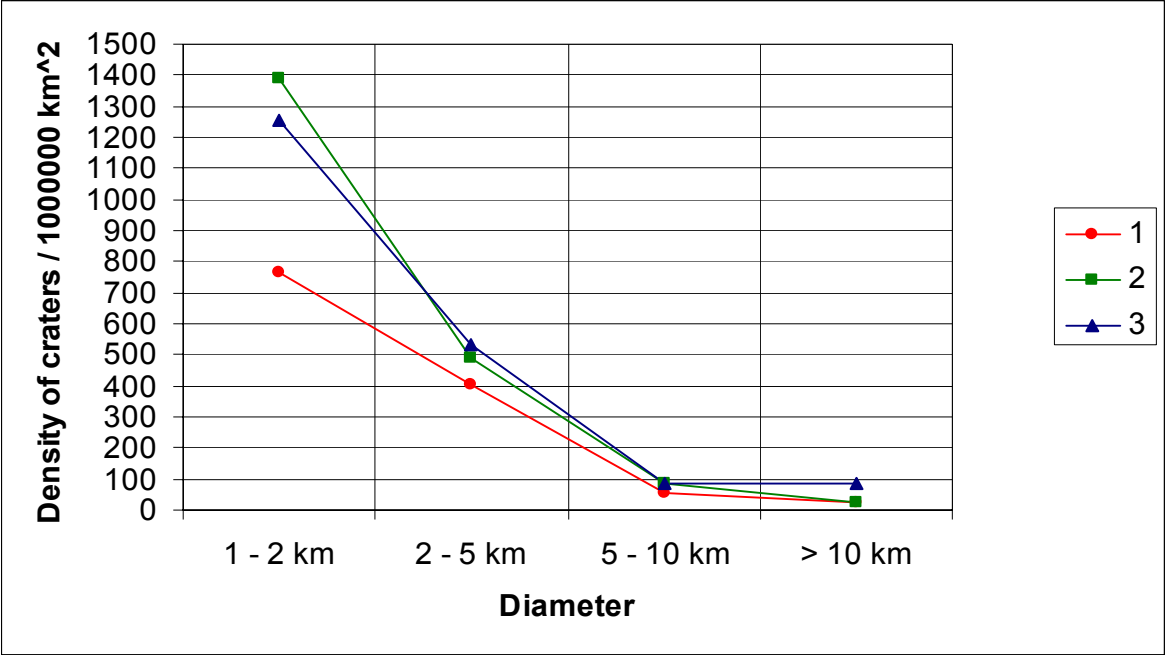


Fig.1 The density of craters in the plain -1, on the slope of Isidis -2, on Sirtys Major Planum-3

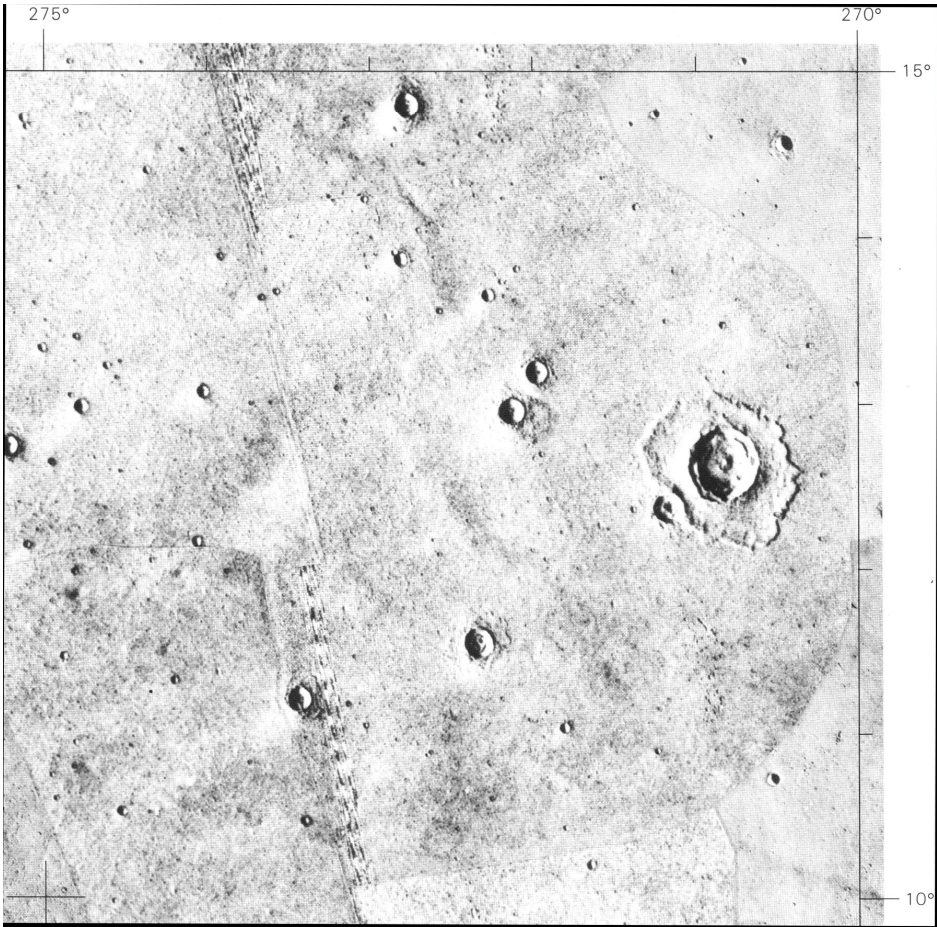


Fig.2 The frame of Photomap of Isidis Planitia.