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**THE MORPHOMETRIC ANALISYS OF THE FEATURES OF MARTIAN CRATERS.** I.A. Ushkin[1], G. G. Michael[2], E.A. Kozlova[3] . 1. Moscow State University, Vorobjovy Gory, 119899, Moscow, Russia, gray_pigeon@mail.ru . 2. ESA, Noordwijk, the Netherlands. greg.michael@rssd.esa.int 3. Sternberg State Astronomical Institute, 119899, Moscow, Russia.

**Introduction:** In the present work the morphometric parameters for 87 large martian craters [1](with diameters from 411 up to 110 kms) have been determined: depth of a crater- ΔH, the relation of depth of a crater to diameter (ΔH/D), height of a rim – h, with the help of profiles constructed on the basis of supervision of space vehicle MGS [2].The comparison with similar morphometric parameters of large lunar craters also is fulfiled. Also attempt of an estimation of thickness of layer of regolith of the planet as result of distribution of approach from the work of Melosh [3] on large craters is lead.

The following extreme parameters of sizes interesting us are received: the maximal values of them are those: <ΔH> =2965 m, <h> =975 m, <ΔH>/D=0,024. Their minimal values the following: <ΔH> =184 m, <h>~0 m, <ΔH>/D=0,001. It is interesting, that the central hill of some craters on the profiles where distinctly visible, strongly towers above rim of a crater (Fig. 1). Comparison of the received results with morphometry of lunar craters [4] has been lead.

As result of generalization of calculations we obtained the following dependence (Fig.2):

A degree of degradation - depth.

ΔH(RD)= -393*RD+2921 for the Mars,

ΔH(RD)= -800*RD+5733 for the Moon.

The height of lunar crater rim [4] for the same degree of degradation is more than for the height of martian crater rim.

Graphic generalization of results in the following conclusion: for the same degree of degradation such morphometric characteristics of lunar craters as depth and height of a rim are expressed more strongly, than at martian craters. It is a result of stronger gravitation on Mars (as speech here goes about large craters for which its role is especially important), and also active atmospheric processes.

**Estimation of thickness of layer of regolith.** Geological targets are not homogeneous and isotropic and have no ideally flat surface. In real situations we deal or with layered targets, or with the targets consisting from casual of rocks with various mechanical properties, but influence of these roughnesses of a relief on process of formation of a crater till now is badly investigated.

The most investigated case - a layered target: the soft layer lays on strong material (it is investigated at the end of 60-th [3]). It has been found, that the morphology of a resulting crater strongly depends on the relation of diameter of a crater on a crest of a rim (D) and thickness of a layer. Process of an estimation of thickness a layer of regolith of a planet on this method (more detailed description of it can be found in [3]) is reduced first of all to correlation of a crater with one of four characteristic morphological attributes - presence of the central hill, a flat bottom, a concentric crater and normal morphology.

For reception of the most authentic estimations we have accepted as follows: have allocated most close laying craters (their coordinates to us are known from [1]). It is natural to expect, that thickness a layer of regolith, appreciated on the basis of morphology of these craters, should coincide approximately. For the greater reliability it is natural to compare the estimations received on craters of various morphology.

**References:** 1. Rodionova J.F., Dekhtyareva K.I. et al. (2000) *Morphological Calague Of the Craters Of Mars.* The Netherlands . 2. http://wufs.wustl.edu/missions/mgs/mola/megdr2.html 3. Melosh G. (1994) *Obrazovanie udarnyh Kraterov. Geologichesky process.* Mir, M. 4. Rodionova J.F. et al., (1988) *An essential morphometric characteristics of lunar cratres., Trudy Gosudarstvennogo Astronomicheskogo Instituta im. P. K. Shternberga, Tom LX, p.179-183.*

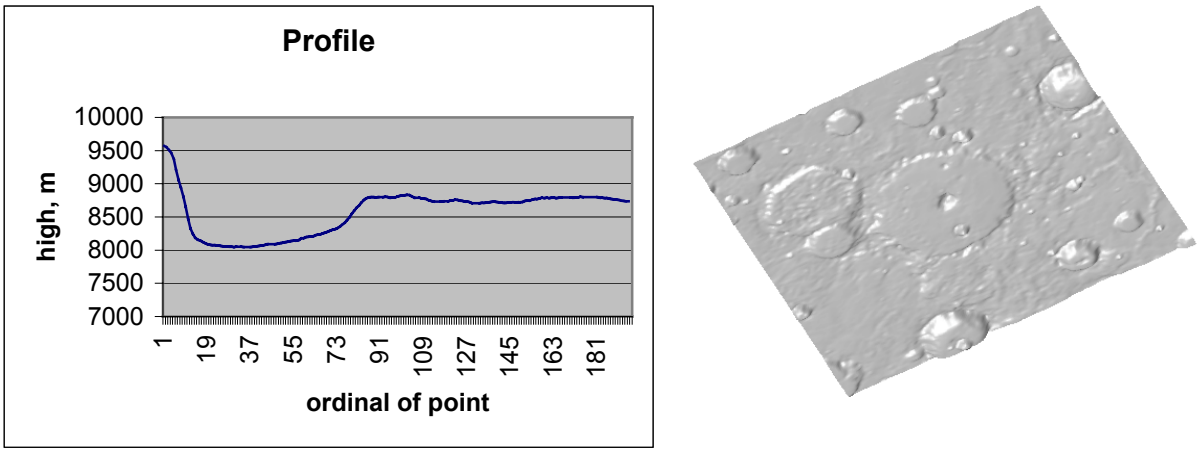


Figure 1. The half-profile of a crater, at which height of the central raising is more than height of a rim approximately on 750 m.

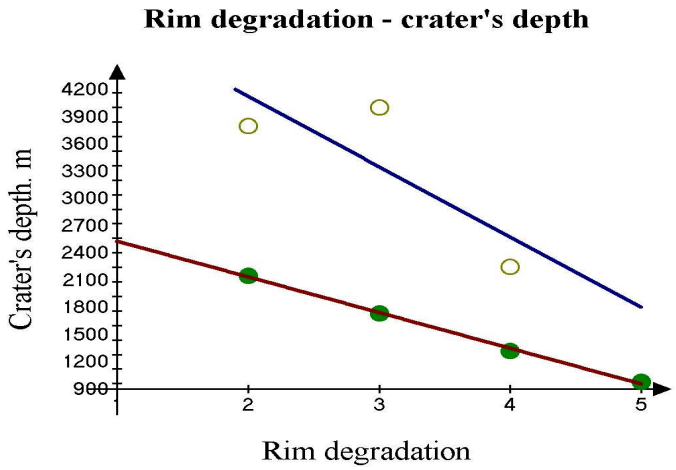


Figure 2. Dependence the crater depth - degree of degradation for craters on Moon and Mars. The upper schedule is for the Moon, the lower – for Mars.