

A HIPSOMETRICAL FEATURES OF THE LUNAR SURFACE FROM THE CLEMENTINE MISSION. J. F. Rodionova¹, O. V. Elkina², E. A. Kozlova¹, V. V. Shevchenko¹, P.V. Litvin². 1. Sternberg State Astronomical Institute, 119899, Moscow, Russia; jeanna@sai.msu.ru 2. Moscow State University, Vorobjovy Gory, 119899, Moscow, Russia.

The results of altimetric data of Clementine Mission are represented in the papers [1,2,3].

Lucey et al.(1994) show that the distribution of elevations on the Moon is distinctly irregular and the near side and far side differ both in mean elevation and shape of the hypsographic curve. There is a correlation between topography and composition. The lack of extensive mare basalt fill in the South Pole – Aitken Basin, despite the thin crust in this region, suggests hemispheric compositional asymmetry in the deep lunar interior [1].

We have compiled the hypsometrical map of the Moon in the Molveide projection where an area was not distorted that was important for the measurements and the map of the South Pole – Aitken Basin on the base of the heights with 0.25° trapezium. The scale of the complete map of the Moon is 1:13000000. It is allowed to show the relief features of the Moon with the 500 m contours. The original data obtained in NASA Planetary Data Center are the heights of 64800 points of 1° trapezium. We have used Arcview (module Spatial Analyst) and Arc Info programs for the data treatment.

The highest and lowest points are on the far side of the Moon. The highest one - 8403 m is to the north of Korolev basin and the lowest one - 7730 m is on the bottom of the South Pole-Aitken basin.

The results of calculating of the different height levels areas are shown on the Fig.1. The comparison with the data [4,5] is fulfilled. The most difference is in the areas of height levels from 0 to 3 km. The medium height of the lunar surface is

0.433 km. So the medium radius of the Moon is equal 1737.577 km. The difference of the medium heights of highlands and maria is 2.3 km on a scale of the total sphere, but on the near side it is only 1.4 km.

More detailed hypsometrical map for the South Pole-Aitken basin is completed with 200 m intervals (Fig.2).

According to new data, the depths of Mare Imbrium, Mare Frigoris, Mare Fecunditatis, Mare Moscoviense are 0.5 km deeper than previous results indicated. The depths of Oceanus Procellarum and Mare Tranquillitatis are 1 km more than in previous data. The depths of Mare Nubium, Mare Smythii, Mare Humorum and Mare Nectaris are 1.5 km greater, the depths of Mare Marginis and Mare Orientale are 2 km greater, and the depths of Mare Humboldtianum are 2.5 km greater than in previous data. The depths of Mare Serenitatis and Mare Crisium agree with previous data.

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References: [1] P.G.Lucey et al. (1994) *Topographic-Compositional Units on the Moon and the Early Evolution of the Lunar Crust. Science.* Vol.266 p.1855-1858. [2] S. Nozette et al. (1994) *The Clementine Mission to the Moon. Scientific Overview. Science.* Vol.266 p.1835-1839. [3] M/T/Zuber et al. (1994) *The shape and Internal Structure of the Moon from the Clementine Mission. Science.* Vol.266 p.1839-1843 [4] I.V.Gavrilov et al. (1972). *Physics of Moon and Planets.* [5]. J.F.Rodionova (1992) *Atlas of the planets and their moons.MIIGAiK,* p.77-81.

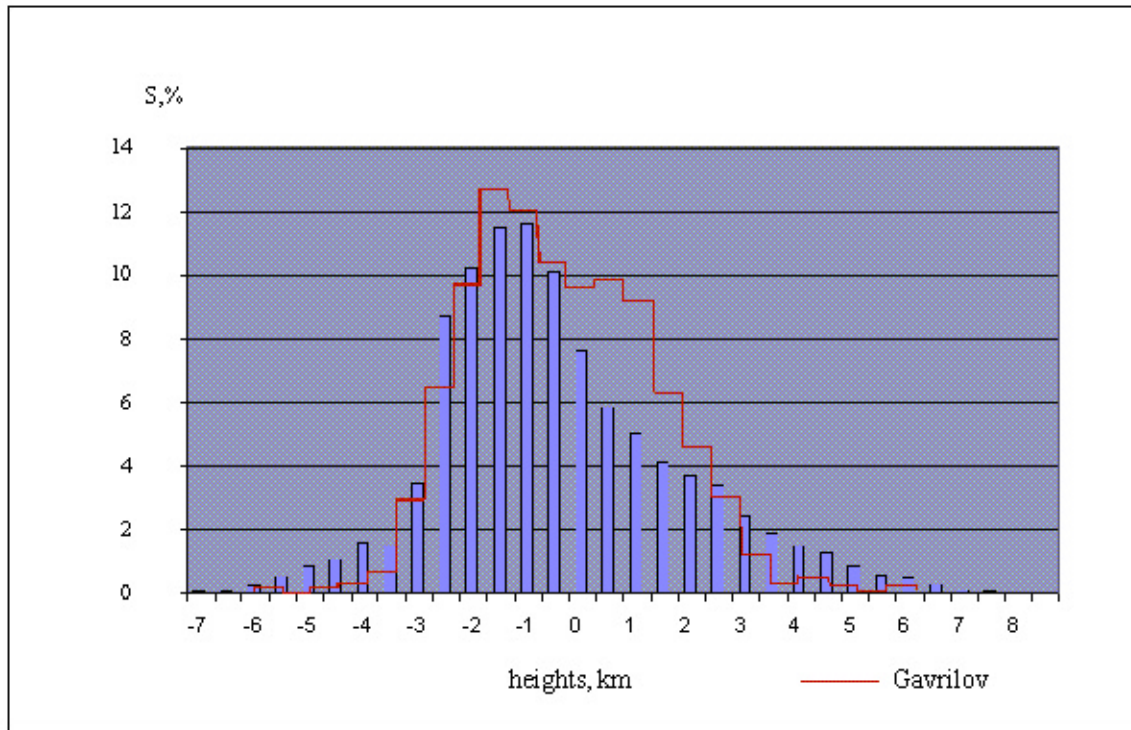


Fig.1. The distribution of elevation on the Moon as a function of area on the base of Clementine data and the comparison with a previous data.

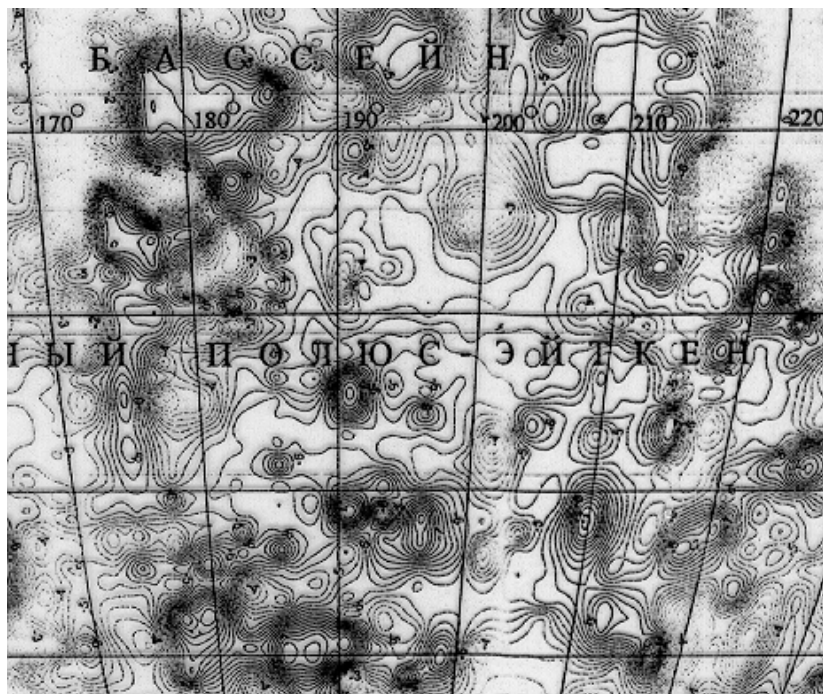


Fig.2. Fragment of the topographical map of the South Pole - Aitken Basin. Contour interval is 200 m.