Date from Clementine Confirms Non-Random Distribution of Lunar Basins and Maria

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Laser altimetry date from Clementine has allowed to determine some of nearly obliterated multiring basins on the Moon that could not be determined on the basis of previous surveying. The Mendel-Rydberg basin, a degraded three ring feature with 630 km in diameter to the south of Mare Orientale is about 6 km deep from rim to floor. The Coulomb-Sarton basin has been discovered on the northwestern portion of the lunar far side. Clementine altimetry reveals a basin about 490 km in diameter averaging 6 km in depth, rim to floor. Three basins in diameter more than 600 km were revealed in the neighbour of the craters Freundlich-Sharonov, Tsiolkovskiy-Stark, Lomonosov-Fleming. The Mutus-Vlacq Basin an ancient feature on the near side was detected by the altimetry. It is about 700 km in diameter and averages about 3 km in depth. There are another two basins on the near side in diameter 350 km not far from the crater Atlas and 300 km in diameter near the crater Darvin.

Lipskiy Yu. N. and Rodionova J. F. shown that 11 from 12 basins has been revealed by the "Luna-3", "Zond-3" and "Lunar Orbiter" pictures of the far side correspond to maria formations diametrically opposite on the near side. For example: Mare Ingenii-antipode of Mare Imbrium, Korolev-Mare Tranquillitatis, Hertzsprung-Mare Fecunditatis, Mare Moscovience-Mare Humorum. In 1975 Schultz and Gault suggested that seismic energy from major impact could cause extensive crustal fracturing and surface disruption on the part of the planet directly opposite the impact. Hughes et. al. (1977) used a finite element code to calculate the effects of a large impact into either a solid planet or a planet with a molten interior surrounded by a thin solid crust. Watts et. al. (1991) consider antipodal surface disruption due to spherical focusing of impact-generated seismic energy to include the effects of layering (especially in the form of a high-density core) and composition (both ice and silicate).

The aim of the paper is an attempt to reveal antipodes for the new basins detected by the Clementine altimetry. The fact is that the Mutus-Vlacq basin is the antipode of the Birkhoff basin and Friendlich-Sharonov is the antipode of Mare Nubium. There is no antipode for the Coulomb-Sarton basin, but there is Rheita Vallis on its place. Date from Clementine shows that the probability of accidental coincidence of the antipodes is very little.