



## **Well known outstanding geoid and relief depressions as regular wave woven features on Earth (Indian geoid minimum), Moon (SPA basin), Phobos (Stickney crater), and Miranda (an ovoid).**

Gennady G. Kochemasov

IGEM, RAS, Moscow, Russian Federation (kochem.36@mail.ru, +7 095 230-2179)

A very unreliable interpretation of the deepest and large depressions on the Moon and Phobos as the impact features is not synonymous and causes many questions. A real scientific understanding of their origin should take into consideration a fact of their similar tectonic position with that of a comparable depression on so different by size, composition, and density heavenly body as Earth. On Earth as on other celestial bodies there is a fundamental division on two segments – hemispheres produced by an interference of standing warping wave 1 (long  $2R$ ) of four directions [1]. One hemisphere is uplifted (continental, highlands) and the opposite subsided (oceanic, lowlands). Tectonic features made by wave 2 (sectors) adorn this fundamental structure. Thus, on the continental risen segment appear regularly disposed sectors, also uplifted and subsided. On the Earth's eastern continental hemisphere they are grouped around the Pamirs-Hindukush vertex of the structural octahedron made by interfering waves2. Two risen sectors (highly uplifted African and the opposite uplifted Asian) are separated by two fallen sectors (subsided Eurasian and the opposite deeply subsided Indoceanic). The Indoceanic sector with superposed on it subsided Indian tectonic granule ( $R/4$ -structure) produce the deepest geoid minimum of Earth (-112 m). The Moon demonstrates its own geoid minimum of the same relative size and in the similar sectoral tectonic position – the SPA basin [2, 3]. This basin represents a deeply subsided sector of the sectoral structure around the Mare Orientale (one of vertices of the lunar structural octahedron). To this Mare converge four sectors: two subsided – SPA basin and the opposite Procellarum Ocean, and two uplifted – we call them the “Africanda sector” and the opposite “Antiafricanda one” to stress structural similarity with Earth [2]. The highest “Africanda sector” is built with light anorthosites; enrichment with Na makes them even less dense than required by the sector highest elevation. Procellarum Ocean is filled with basalts and Ti-basalts. The SPA basin must be filled with even denser rocks. One expects here feldspar-free, pyroxene enriched rocks with some admixture of Fe metal and troilite. The spectral observations of Carle Pieters [4] confirm orthopyroxene enrichment and absence of feldspar. Enigmatic large and deep depression of crater Stickney on Phobos with an appropriate scale adjustment to much larger Earth and Moon occupies a similar structural position to the Indian geoid minimum and the SPA basin. Such situation cannot be random and proves a common origin of these remarkable tectonic features at so different celestial bodies. This conclusion is reinforced by taking for a comparison another small heavenly body- Uranus satellite Miranda. Imaged by Voyager 2 spacecraft in 1986 it shows two kinds of terrains (PIA01980 & others). Subsided provinces (ovoids) characterized by intensive curvilinear folding and faulting interrupt uplifted densely cratered old provinces. One of the deeply subsided ovoids with curvilinear folds pattern (compression under subsidence) perfectly fits into a sector boundary.

References: [1] Kochemasov G. (1999) Theorems of wave planetary tectonics // Geophys. Res. Abstr., V.1, #3, 700. [2] Kochemasov G.G. (1998) The Moon: Earth-type sectoral tectonics, relief and relevant chemical features // The 3rd International Conference on Exploration and Utilization of the Moon, Oct. 11-14, 1998, Moscow, Russia, Abstracts, p. 29. [3] Kochemasov G.G. (1998) Moon-Earth: similarity of sectoral organization // 32nd COSPAR Scientific Assembly, Nagoya, Japan, 12-19 July 1998, Abstracts, p. 77. [4] Pieters C. (1997) Annales Geophys., v. 15, pt. III, p. 792.