

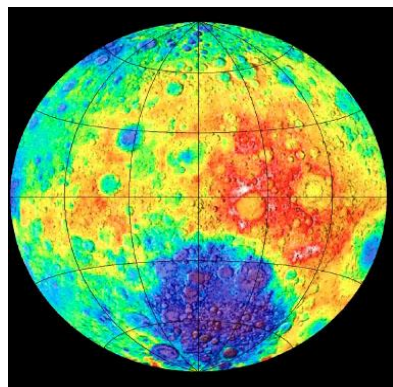
The lunar South Pole-Aitken Basin: a twin of the Indian geoid minimum?

G.G. Kochemasov

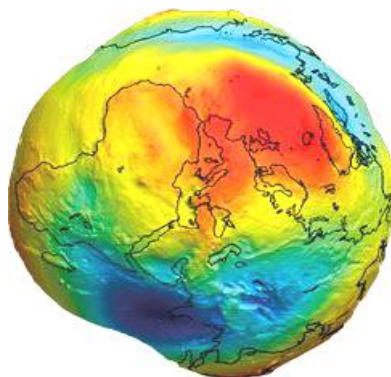
Earth and its satellite both are well studied topographically and gravimetrically. It turned out that at both bodies there are solitary unique planetary scale objects origin of which puzzles scientists. Geophysicists know about existence of an unique depression in the geoid form on the Indian Ocean aquatory deep -112 m but its origin is mysterious. According to prevailing since some time the plate tectonics the basin of the Indian Ocean was formed as a result of moving apart core blocks around a triple junction of the middle-ocean ridges. Such interpretation of the present tectonics contradicts to a real disposition of different ages planetary geologic blocks around the Indian minimum [1] and does not explain its profound nature. The minimum occurs at the axe “b” of three main Earth’s moments of inertia and thus is a fundamental part of its rotation figure [2].

Lunar Basins and Marea, as it is known, are traditionally considered as traces of impacts of giant cosmic bodies during an earlier bombardment (3 to 4 b. y. ago). Even their regular symmetric disposition on the surface is neglected [3]. However, serious difficulties recently arise in concordance of their supposed ages with ages of “impact” breccias and relations between them. But the supporters of impacts stand firm on their opinion and do not accept alternatives. The South Polar-Aitken basin is considered as the largest impact basin in the Solar system; its depth is about 8 km with the total lunar relief range about 16 km.

The comparative wave planetology [3-4 & others] could help in solution of the question. It turns out that both considered planetary structures occupy analogous positions in a wave structure of their bodies (Fig. 1-3). They are deeply subsided sectors (πR -structures) on their respective uplifted continental highland segments-hemispheres ($2\pi R$ -structures) [5]. Such regular their arrangement on two globes makes dubious their interpretation according to the hypotheses of plate tectonics and impacts [5, 6].



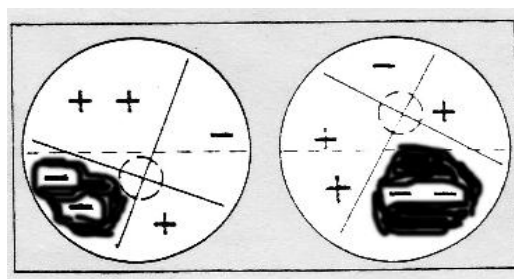
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Fig. 1. Lunar geoid. Center-down (dark blue) – SPA basin (moontopogeoidusgs_farside.jpg).

Fig. 2. Earth’s geoid. Center-down (dark blue) – Indian minimum (832e4f812d1e_.jpg).



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Fig. 3. Schemes of different levels (+, ++, -, --) tectonic sectors on continental segments-hemispheres of the Moon (left) and Earth. The sectors are grouped around the Mare Orientale and the Pamirs-Hindukush mountain massif. Black – the most subsided sectors: SPA basin and Indian geoid minimum.

Similarity of the lunar and Earth's deepest geoid minima (the SPA Basin and the Indian Ocean basin) is proven by their even relative sizes, similar tectonic settings and dense mantles (Fig. 1-3) [5-7]. To these decisive factors one ought to add some similarity of the inner structures. Thus, very characteristic pointed sectoral projection of the Hindustan peninsula has an analogy in the SPA Basin (Fig. 4-5) in form of pointed relatively less dense projection in limits of the round geoid anomaly. To the west and east of the projection the geoid anomaly increases, as well as on a spacious territory to the south. Such internal structure corresponds to the subsided core blocks around the Hindustan: the Arabian Sea, Bengal Bay and Indian Ocean. Such analogy is explained by an interference of lithosphere waves making a tectonic pattern of both planetary bodies [4 –7 & others]. The ascertain of “relationship” of two largest geoid anomalies in the Earth-Moon system might be considered as an “blow” at once at two planetary tectonic hypotheses – steady delusions (plate tectonics and early giant impacts).

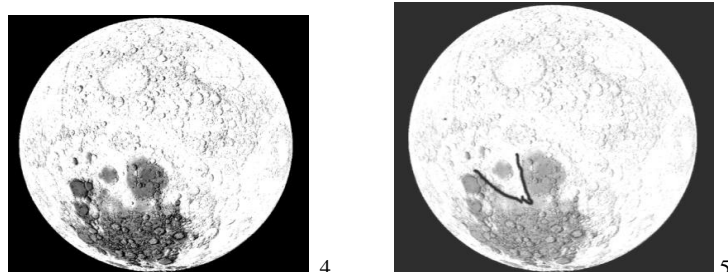


Fig. 4-5. Detailed and contrast enhanced lunar SPA geoid minimum displaying a sectoral “peninsula” surrounded by “seas”.

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