LIPSKIY-RODIONOVA' LUNAR ANTIPODES AS PRECURSORS OF A REGULAR WAVE PLANETOLOGY

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The first observations of the lunar far side allowed to compare it with the near side and draw very important conclusions in the very beginning of planetary studies based on spacecrafts. Yu. N. Lipskiy and Zh. F. Rodionova noted that basins and maria of the two lunar sides are diametrically opposite and moreover are placed in mutually perpendicular great circles [1, 2]. Randomly placed impacts cannot produce this regular pattern. Following years however obliterated this fundamental fact under burden of weakly justified but very agressive impact hypothesis.

Studies of symmetries and regularities on other celestial bodies and in particular on Earth [3, 4] always based themselves on this firmly established fact of the lunar antipodality. The Lipskiy-Rodionova findings encouraged scientists believing in regular nature. Accumulation of data about ubiquity of symmetry-antisymmetry in the world of celestial bodies extremely heterogeneous by masses, compositions and physical states (from a small asteroid to Sun) compeled to think about reasons of such a universal phenomenon. A natural answer was – a wave!

All celestial bodies move in elliptical orbits which were more elongated in the geological past. Changing orbit curvatures, velocities anf accelerations cause inertia-gravity waves warping rotating bodies in 4 directions (ortho- and diagonal). An interference of warping waves having standing character in closed spheres of celestial bodies produces uprising, subsiding and neutral tectonic blocks size of which depends on a wavelength. The following theorems of the wave tectonics can be proved [5, 6].

1. Celestial bodies are dichotomic.
2. Celestial bodies are sectoral.
3. Celestial bodies are granular.
4. Angular momenta of different level blocks tend to be equal.

The first theorem reflects an action of fundamental waves (long $2\pi R$, where R is a body radius), the second one deals with obertones (the first obertone $-\pi R$). The third one describes interference of waves lengths of which are proportional to orbital periods (a scale is Earth with a granula size $\pi R/4$). The fourth one explains haw a rotating body keeps its integrity. Highly non-spherical bodies as asteroids however meet this requirement with difficulties and thus tend to split producing binaries, polycomponental bodies, satellites. Larger bodies keeping their overall sphericity develop tectonic stresses between heterogeneous sector-blocks.

The tectonic granulation depends on orbital periods or frequency of orbiting. It is rather simple for planets orbiting Sun but complicated for satellites having the second orbit around their planets. Satellites are granulated according to their two orbits (high and low frequencies) and by action of modulated oscillations. In a full concord with the wave theory a low frequency modulates a high frequency and on satellites surfaces appear granulas of intermediate sizes. That is why satellites are often covered with a range of closely spaced granulas (craters) of equal or various sizes; an impact origin concerns only a part of them. Wave woven modulated granulas are effective on surfaces of Triton, Titan, Proteus and some other satellites. Modulated waves are in Jupiter's atmosphere (orbiting around the centre of Jovian system and around Sun). On heavily cratered surface of the Moon along with impacts have to be distinguished granulas of $\pi R/4$ size (maria and basins), $\pi R/60$ and other modulated sizes [7].

It is important to note that similarities of lunar and terrestrial planetary structures (dichotomy, sectoring, granulation) make dubious both the impact and plate tectonic hypotheses prevailing now in planetology and geology. It is hardly possible that sets of similar structures on two planetary bodies are produced by two entirely different exo- and endogenic processes.

The concept of celestial bodies includes Sun (a star) as one of them. Tectonic dichotomy, sectoring and granulation [6] are inherent in Sun and so in other stars. Binaries and variable stars are very typical. Some supergiant stars show heterogeneity in surface brightness. Variability of stellar atmospheres is a common feature: glitter oscillation, colour variability, changing spectra, variability of stellar wind, atmospheric pulsation are well documented [8]. Periodicity or quasiperiodicity of variability changes from hours to years. Physical mechanisms of stellar variability are not well understood. We suppose that stellar variability of various periodicities is connected with geometrizing bodies wave warpings observed in our solar system. In this relation the Kepler's explanation of twinkling stars (scintillation) as rotating polyhedrons now looks very close to reality.

References:

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Summary: The pioneering works of Yu. N. Lipskiy and Zh. F. Rodionova on regularities in lunar tectonics (1972-1975) were later used in developing a general planetary wave tectonics conception. It shows a regular character of tectonic dichotomy, sectoring, granularity of celestial bodies, including stars. It connects widespread variability of stellar atmospheres with their wave induced structures.