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Principal structural difference between the inner and outer planets of the Solar system

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The wave planetology [1& others] relates structural peculiarities of planetary bodies with their orbital characteristics. “Orbits make structures”. This statement means that a cause of movement of all planetary bodies in non-round (elliptical, parabolic) keplerian orbits they are subjected to warping action of inertia-gravity waves appearing in them due to periodically changing accelerations. These waves in closed rotating spheres acquire a stationary character and 4 spreading directions (ortho- and diagonal). Their interference leads to uprising (+), subsiding (-) and neutral (0) tectonic blocks size of which depends on the warping wavelengths. The longest in any body fundamental wave 1 long 2πR causes always present tectonic dichotomy (a tetrahedron structure) – an opposition of uplifted (+) and subsided (-) hemispheres (segments). The first overtone wave 2 long πR brings about tectonic sectoring obeying a structural octahedron. On these basic features are superimposed tectonic granules size of which depends on orbiting frequencies: higher frequency smaller granule. These three main structural thesis’s of the wave planetology were compacted in to three theorems: 1) celestial bodies are dichotomous; 2) –“- are sectoral; 3) –“- are granular [2 & others]. Tectonic granules increase their sizes with increasing solar distances. Solar photosphere πR/60, Mercury πR/16, Venus πR/6, Earth πR/4, Mars πR/2, asteroids πR/1, Jupiter 3πR, Saturn 7.5πR, Uranus 21πR, Neptune 41πR, Pluto 62πR. It is easy to see that there are two distinctive populations of planets in respect of their granulation: the inner and outer planets (this only confirms this basic division derived from other fundamental features of the planets). The tectonic granules of the inner terrestrial planets are smaller than the planets’ dimensions; the tectonic granules of the outer planets are larger than the planets’ dimensions. If one draws a curve with planets

heliocentric distances (in log) at the abscissa axe and the tectonic granule sizes (relative to the fundamental wave as one) at the ordinate axe then the Earth point occurs at the unique bending point of this curve [3]. Thus, the a. u. is abscissa of the bending point of so constructed “cosmogonic curve”, and asteroids are in a point where a granule size and the fundamental wave are in resonance 1:1. Thus, in the asteroid belt no large planetary body would have been assembled (no Phaethon!) because of a very strong wave resonance scattering debris (the whole mass of asteroids is about 0.01 the Earth’s mass). The increasing granule size of the terrestrial planets makes them more or less globular including Earth (4 waves in the great circle = 8 granules) and deformed feather from Sun. Thus, Mars has an ellipsoid shape because its 2 waves (4 granules) inscribed in the great circle inevitably extend it in one direction and contract in the perpendicular one. All asteroids have an oblong convexo-concave shape because warping them one wave (= fundamental wave with which it is in the strongest resonance) inevitably bulges one hemisphere and presses in the opposite one (dichotomous tectonics). The outer planets having tectonic granules larger than their bodies do not have their direct wave impressions. But two peculiarities betray them. Firstly, atmospheres of the gas giants have granulations size of which is calculated by a modulation of their high frequencies of rotation by the much lower frequencies of orbiting Sun. Secondly, their well developed ring-satellite systems of huge dimensions witness an intensive material scattering probably due to an action of these large waves. **Referances: [1]** Kochemasov G.G. Tectonic dichotomy, sectoring and granulation of Earth and other celestial bodies // Proceedings of the International Symposium on New Concepts in Global Tectonics, “NCGT-98 TSUKUBA”, Geological Survey of Japan, Tsukuba, Nov 20-23, 1998, p. 144-147. **[2]** Kochemasov G.G. Theorems of wave planetary tectonics // Geophys. Res. Abstr.1999. V.1, ź3, p.700. **[3]** Kochemasov G.G. Orbiting frequency modulation in Solar system and its imprint in shapes and structures of celestial bodies // 32^{nd} microsymposium on comparative planetology (Vernadsky-Brown microsymp. 32), Abstr., Moscow, Vernadsky Inst., 88-89.