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A wave geometrization of small heavenly bodies

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The wave planetology [1-6 and others] states that all planetary bodies moving in non-round keplerian orbits and rotating are subjected to warping action of inertia-gravity waves. They have a standing character and four interfering directions (ortho- and diagonal). Their lengths include the fundamental wave 1 and its overtones. To each wavelength corresponds a special geometric figure – polyhedron. Thus, the wave 1 creates a tetrahedron – the simplest Plato' figure, the wave 2 creates an octahedron, the wave 4 a cube and so on. With diminishing wavelength and an amplitude produced polyhedra become less visible. Moreover, in the larger bodies with diameters more than 400 to 500 km gravity smoothes features of polyhedra making more or less perfect spheres. Still the strongest figure tetrahedron is always present in bodies of various sizes as the ubiquitous tectonic dichotomy (2πR-structure) – an opposition of two hemispheres – one uplifting and expanding and another subsiding and contracting. In small bodies this structural feature is manifested in their ubiquitous convexo-concave shape (in the main asteroid belt all bodies even the largest Ceres and Vesta are oblong and dichotomous). A tetrahedron and dichotomy are fundamentally connected as any of 4 axes of this figure cut crosswise has at one side a vertex and at another a face. Three other faces narrow to a vertex (contraction) and widen to a face (expansion). The wave 1 creating a convexo-concave shape of small bodies leads to fracturing the convex hemisphere (famous "saddle" on asteroid Eros and a similar "saddle" on satellite Calipso PIA07633) and pressing in the concave hemisphere with producing a hollow, depression (sometimes mistakenly interpreted as an impact crater). Some points of view allow tosee tetrahedron features in Thebe (PIA02531), Hyperion (PIA08904), Telesto (PIA07546). The first overtone wave 2 creates an octahedron (πR-structure) superimposed on dichotomy. Firstly it was observed as a "diamond" shape of Amalthea (PIA01074) never explained until now when a wave mechanism was offered for de-

ciphering regular cosmic polyhedra. Octahedron outlines present certain viewpoints of Yanus (PIA06613), Phoebe (PIA06066), Helene (PIA08269), Phobos (PIA04589), Prometheus (PIA07549). Interfering waves 4 produce a cube (πR/2-structure). This shape was rather widely discussed earlier as a geometric approximation of the Earth's globe. Now one can discern this Plato's polyhedron directly in outlines of Epimetheus (PIA07531) and Helene (PIA07547). Pandora (PIA07530) possibly presents more complex polyhedron. Severe bending and fracturing of small convexo-concave oblong bodies sometimes ends in their breakage. By such way are produced double asteroids (Toutatis ?), asteroids with satellites [6]. A special interest presents Enceladus. Having 505 km across it keeps its globular shape but its dichotomous nature manifests itself in opposition of the south and north polar regions. At the north there is plenty of craters (not all impacts but also the past degassing traces), at the south "tiger stripes" – traces of contraction and active expulsion of vapor- ice particle material. This dust material actively contributes to a saturnian ring construction. **References**: **[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. 433 Eros as a natural model of planetary wave processes // The 32^{nd} microsymp. on comparative planetology: Abstr., Moscow, Vernadsky Inst., 2000, p.86-87. **[4]** Kochemasov G.G. The wave planetology illustrated - I: dichotomy, sectoring // 44^{th} Vernadsky-Brown microsymposium "Topics in Comparative Planetology", Oct. 9-11, 2006, Moscow, Vernadsky Inst., Abstr. m44_39, CD-ROM. **[5]** Kochemasov G.G. Cassini' lesson: square craters, shoulder-to-shoulder even-size aligned and in grids craters having wave interference nature must be taken out of an impact craters statistics to make it real // 42^{nd} Vernadsky-Brown microsymposium "Topics in Comparative Plantology", Oct.10-12, 2005, Moscow, Vernadsky Inst., Abstr. m42_31, CD-ROM.

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