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Wave features of the Saturnian system

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Not mentioning rings with prominent waves in them in radial and tangential directions one observes clear wavings shown in cross-cutting ridge-groove systems on icy satellites. This type of structurization along with impact features (statistics of which is unclear because of an important admixture of wave induced circular, square, hexagon forms) is affecting all satellites. Wave woven circular forms (craters) were predicted before the arrival of Cassini at the Saturnian system [1]. A decisive step to prove their existence is a calculation of their sizing using their orbital frequencies. The referring scale is Earth with its orb. fr. 1/1 year and a granula size πR/4. For Hyperion, for example, wih its orb. fr. 1/21.3 days granula size is 5 to 8 km. This size is detected in images of Hyperion with "spongy" structure as a size of equal -dimensional cells in grids. Numerous craters, isometric moulds and mounds controlled by crossing wave warpings have characteristic sizes which are not random. Earlier in pre-Cassini era we have shown that size of Titan's granulation in IR-images can be calculated using two orb. fr. of this satellite: around Saturn (1/16 days) and Sun (1/30years) [1]. Now, having excellent Cassini's images of satellites (Credit: NASA/JPL/Space Sc. Inst) we detected many of calculated 4 sizes (2 tied to main frequencies and 2 to modulated side ones) [2]. The smallest seen sizes have chains of risen blocks $\sim$100 m across on "chess-board" terrain of Enceladus (PIA06252). This size corresponds to one of the side frequencies (1/1.37d.x 1/10950 d) and is $\sim$100m. Another wave feature affecting all bodies is the tectonic dichotomy (wave1 or 2πR-structure). Firstly known as two-faced Iapetus it is now observed on all satellites as an opposition of two hemispheres with differing compositions or structures or both. Especially spectacular it is in small bodies acquiring convexo-concave (bean) shape. Wave2 or πR-structure is observed as an octahedron or its parts in small satellites and differing sectors around some vertices for larger ones. (i.g., Hyperion, Phoebe). Floors of many depressions (craters) are filled with darker (presumably denser) material as it should be according to tectonics of a rotating body: lower block – denser infilling. So, as was earlier shown for the

inner planets, the Galilean satellites, the Saturnian system also follows the main rule of the wave planetology: “Orbits make structures”. References: **[1]** Kochemasov G.G. (2004) 35^{th} COSPAR Sci. Assembly, July 2004, Paris, France. Abstr.#COSPAR04-A-00909, CD-ROM; **[2]** Kochemasov G.G. (2005) Vernadsky-Brown Microsymp.-42, GEOKHI, Moscow, Oct. 2005, Abstr. # M42_31, CD-ROM.