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Systematic not random "peppering" saturnian surface by the IR round clouds: wave features with predictable size

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On a few occasions before [1-2] were shown that small storms (a few hundreds km across) having a wave interference nature are characteristic features of the wide polar regions of Saturn. Now there is a possibility to show that these storms (round cloudy features) have a wider distribution on the saturnian surface occurring not only at poles but also at the lower latitudes. Thus, almost entire surface of this planet or more probably its extra-tropical zones are covered with not randomly distributed IR spots ("leopard skin" drapes the globe). Recently acquired Cassini infrared images (the wavelength often 750 nm) published by NASA/JPL/Space Science Inst./ /University of Arizona cover the south polar region – PIA8332, areas at 46 degrees of the south latitude – PIA9734, 24 degrees north of the equator – PIA09792, 44 degrees of the north latitude – PIA9778, 59 degrees of the north latitude – PIA9787, around the north pole – PIA06567, and somewhere else –PIA09001. The spots vary in diameters from about 100 to 900 km (on an average 400-500 km, but they seem smaller at the south and at tropical belt), extend along some preferable directions, normally along cloudy belts, but also crossing them, have more or less clear but often washed off boundaries. These spots correspond to one of two modulated side frequencies calculated by division and multiplication of the high frequency around the center of the saturnian system (1/10h.= grain size πR/3448) by the low frequency of orbiting around Sun (1/30 y= grain size 7.5πR). They are [1/3448 : 7.5] πR and [1/3448 x 7.5]πR or 7 and 410 km across [1-2]. The size $\sim$400 km is observed now. Another the smaller side granule about 7 km across is out of the present resolution. But one of the latest images PIA08934 is enough detailed to reveal a very fine granula-

tion comparable to a sandstone texture with a sand particles size about 50 to 100 km. This size is comparable with the theoretical one – 55 - 61 km main granule size – corresponding to the saturnian atmosphere rotation (orbiting the center of the saturnian system) 1/10.2 h – 1/10.8 h. = grain size πR/3448- πR/3082. It is understood that the larger main granule size 7.5 πR (1/30 y orbiting frequency) is not directly observed in the Saturn's body unless it brings its unusual flattening and enormous dimension of its system consisting of rings and many satellites (the great systems are thus expected and observed at the other outer planets in contrast to the inner planets). The wave planetology is valid also for comparison of granulations of existing (and studied) atmospheres around the Solar system bodies: the photosphere, Venus, Earth, Mars, Jupiter, Saturn, Titan [3]. There is a range of atmospheric granule sizes inversely proportional to the atmosphere orbital frequencies (around the center of the Solar system or the centers of their planetary systems; for the decoupled venusian atmosphere its rapid rotation): Jupiter - granule πR/3539, Saturn – πR/3448 (3082), Venus – πR/295, Titan – πR/91, Sun – πR/48 (60), Earth – πR/4, Mars – πR/2. Along with the above grain sequence modulated granules of other sizes simultaneously exist in atmospheres [3]. They represent side waves due to interactions of orbits in which bodies move simultaneously. In this respect very interesting is slow movement of our solar system in Galaxy due to which side waves of the radio diapasons appear [4]. **References: [1]** Kochemasov G.G. (2007) Calculating size of the Saturn's "leopard skin" spots // LPSC XXXVIII, Abstr. #1040, CD-ROM. **[2]** Kochemasov G.G. (2007) Saturn's infrared spots at the southern and northern polar regions and calculation of their sizes by a wave modulation procedure// EUROPLANET-2007 Science Congr., August 19-24, 2007, Potsdam, Germany, EPSC2007-A-00017, CD-ROM. **[3]** Kochemasov G.G. (2007) Atmospheric wave granulation in the solar system: the star – planets – satellite // 46^{th} Vernadsky-Brown microsymposium on comparative planetology, 2-3 oct. 2007, Moscow, Russia, Abstr. m46_37, CD-ROM. **[4]** Kochemasov G.G. (2001) Inertia-gravity waves of various scales on celestial bodies surfaces, in vertical section and their relation to radiowaves // 34th microsymposium "Topics in comparative planetology" (Vernadsky-Brown microsymposium 34), Abstracts, Moscow, Vernadsky Inst. (GEOKHI), CD-ROM.