TENDENCY OF LEVELING ANGULAR MOMENTA BETWEEN TROPICAL AND EXTRA-TROPICAL ZONES OF CELESTIAL BODIES: EARTH, MARS, SATURN, TITAN, IAPETUS, TETHYS. G. G. Kochemasov, IGEM of the Russian Academy of Sciences, 35 Staromonetny, 119017 Moscow, Russia, (kochem.36@mail.ru).

Often observed a sensible difference in appearance and structure between tropical and extra-tropical zones of various heavenly bodies belonging to terrestrial rocky planets, giant gas planets, icy satellites compels to look for a common reason of such phenomenon. All bodies rotate and their spherical shape makes zones at different latitudes to have differing angular momenta as a distance to the rotation axis diminishes gradually from the equator to the poles (this is felt particularly when one launches rockets into space –preferable more cheap launches are from the equatorial regions – Kourou is better than Baikonur). One of remarkable changes occurs at tropics. As a single rotating planetary body tends to have angular momenta of its tectonic blocks equilibrated it starts mechanisms leveling this basic physical property. At tropical zones (bulged also due to the rotation ellipsoid) the outer shell – crust tends to be destroyed, sunk, subsided and shrunk as a consequence; a density of crust material changes; an atmosphere reacts changing chemistry and structure; in terrestrial anthroposphere man looses its mass and stature. But according to the Le Chatelier rule mechanisms with an opposing tendency also begin to act.

At Earth the wide planetary long tropical zone is marked by destruction of the crust. It is demonstrated by development of numerous islands of the Malay Archipelago (the Sunda Isls., Maluku Isls, Philippines) between the Southeastern Asia and Australia. In Africa and South America huge depressions of the Congo and Amazon Rivers develops where the Archean crust is subsided to depths of more than 2 km. In the Pacific along the equator numerous islands of Micronesia occur. Subsidence of the basaltic oceanic crust is followed by an intensive folding and faulting of basalt and sedimentary layers (Fig. 1) as a larger mass must be held by a smaller space (a planetary radius is diminished). The central Atlantic is very demonstrative in this sense suffering huge transform fault zones changing to more quite tectonics to the north and south where basaltic effusions form large provinces. This addition of dense basalts to the crust plays to increasing angular momentum of the extra-tropical blocks.

At Mars the widespread enigmatic chaotic and fretted terrains at the highland-lowland boundary could be considered as traces of the crust destruction along the wide tropical belt. A system of hillocks and their relics and separating them depressions is controlled by a crosscutting tectonics. Prevailing subsidence here is characteristic.

At Saturn a wide tropical zone usually has higher albedo than extra-tropical ones. Relatively heavier methane clouds in the H-He atmosphere are absent around the equator and concentrated on the higher latitudes (Fig. 2).

In the tropical zone of Titan the darker methane lowlands (Fig. 3) are normally rippled in at least two directions with spacing a few km to 20 km (such forms erroneously are taken as dunes). This subsidence rippling gradually is replaced by smooth surfaces of dark basins (possibly liquid methane) at the higher northern and southern latitudes. This planetary pattern (Fig. 4, 5) is comparable with a behavior of the basalt floor of terrestrial oceans.

On Iapetus the wide equatorial zone of the bright trailing hemisphere is distinguished by relatively numerous craters with darkened floors (Fig. 6). This terrain connects both flanks of the dark leading hemisphere and is a continuation of its equatorial bulge (a squeezed out feature as a result of the dark hemisphere subsidence). Thus looks tending subside and disintegrate tropical terrain on the uplifted bright hemisphere.

Around the Tethys' equator there is a band of slightly darker surface material (Fig. 7). It may be an area of less contaminated ice and ice with a different structure than ice at higher latitudes as think Cassini scientists. If it is coarser-grained (more loosely packed) and purer then the equatorial region tends to be less dense diminishing its angular momentum. A crosscutting wave rippling producing chains of square craters here is also clearly visible.

Under more close inspection of other planetary bodies and Sun this uniform separation of tropical and extra-tropical zones should be discovered.

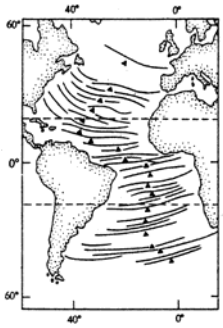

Fig. 1

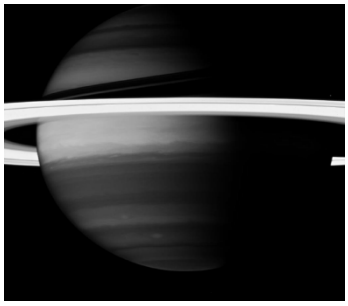
Fig. 2

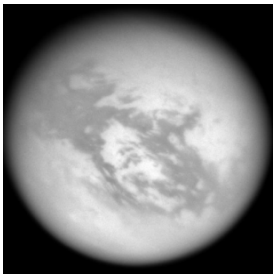
Fig. 3

Fig. 4

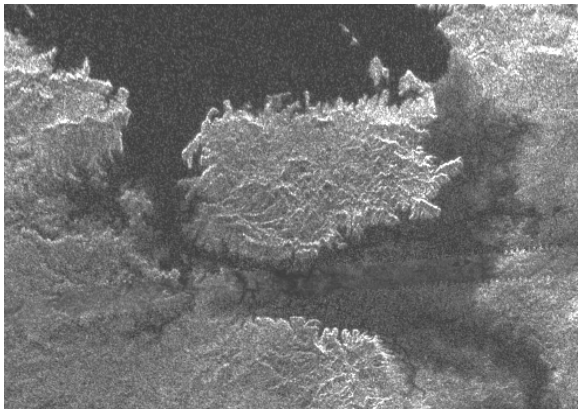

Fig. 5

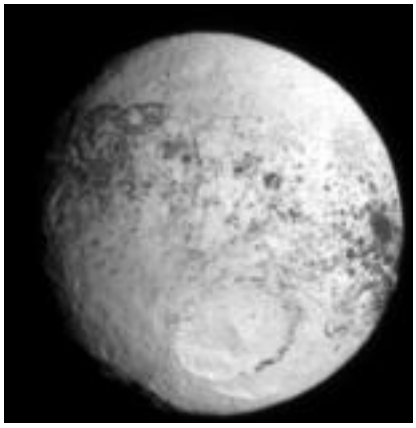

Fig. 6

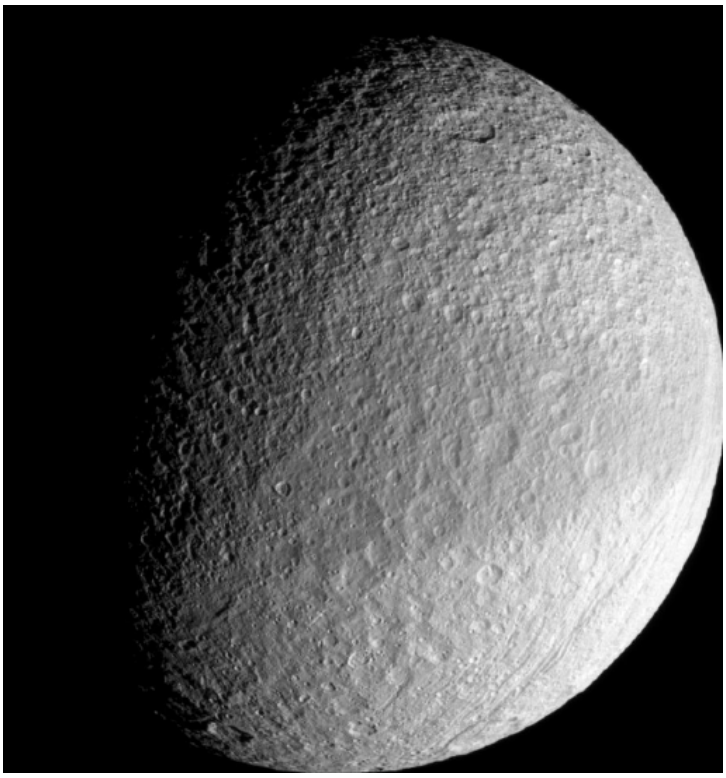

Fig. 7

Fig. 1. Earth: Intensive faulting of the tropical zone of the Atlantic bottom. **Fig. 2. Saturn**: PIA09769, a weak methane absorption at the equatorial belt (the bright area, IR light, 890 nm). **Fig. 3, 4, 5. Titan**: **Fig. 3**. PIA08995, equatorial region (dark) with the bright region Adiri at center, IR-939 nm, **Fig. 4.** PIA03567, radar image, intersecting ripples, grid spacing 1-2 km., 13˚ south lat., 300˚ west long., **Fig. 5.** PIA09180, radar image, a big lake, 75˚ north lat., 310˚ west long. **Fig. 6. Iapetus**: PIA09756, continuation of the dark equatorial ridge of the leading side on the trailing side by dark floor "craters". **Fig. 7. Tethys**: PIA09766, dark equatorial belt, leading side. *Images credit: NASA/ JPL/ Space Science Inst.*