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CYCLONIC ACTIVITIES ON JUPITER AND EARTH; CATASTROPHIC ATMOSPHERIC PHENOMENA OF THE WAVE NATURE: EL-NINO, CYCLON, TORNADO

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Atmosphere is one of the outer geographical envelops occurring under influence of the tectonics of the solid Earth. In its structure is the first order feature – global tectonic dichotomy made by the fundamental wave long 2πR (Fig. 1) The uplifted continental hemisphere opposes to the subsided Pacific one. This global structure is complicated by superimposed sectors due to the first overtone wave2 (long πR). Corresponding to the Earth's orbit tectonic granulation has size πR/4 due to the wave πR/2. Characteristic tectonic formation of this size (~5000 km in diameter) is a Precambrian platform or a craton with its folded frame. Eight such granules are placed in the great planetary ring – equator (Fig. 3).

To the tectonic dichotomy in the atmosphere correspond two global cells: one with the lower pressure with a centre of constant measurements in Darwin (Australia) on the continental hemisphere and the second with the higher pressure with a centre in the Easter Island in the Pacific hemisphere (Fig. 1, [2]). From the point of view keeping the angular momentum such opposition of atmospheric pressures is understandable: to the uplifting eastern hemisphere with increased radius corresponds the lower pressure, to the subsided oceanic western hemisphere with diminished radius corresponds the higher pressure. Periodic changes of this stable configuration of pressures- increasing pressure in Darwin and lowering over Easter Island – leads to a change of oceanic current in the Pacific, increasing water temperature and origin of unfavorable often catastrophic conditions in the environment.

Cyclones or typhoons with diameters up to several thousands km – cells of the lower pressure – arise normally in the tropics (Fig. 3). Their sizes are typically rather smaller than calculated for tectonic granules (5000 km). One might explain this by a tendency of diminishing sizes of objects in the tropical and equatorial belts for the purpose of diminishing their angular momentum. This process of diminishing is characteristic also for other geospheres. For example, in the lithosphere (crust) there is subsidence of platform bases, in the anthropoposphere there is a global phenomenon of pygmeoidness. According to the Le to Chatelier principle, diminishing sizes of atmospheric cells (granules) are compensated by increasing speed of their rotation for keeping their angular momentum. Such rapidly rotating objects, and also taking in moisture for increasing their mass, come down to coasts and inlands with downpours and hurricanes.

Tornado – smaller rotating objects possess huge destructive force (Fig. 2). Their sizes are connected with atmospheric cells made by rotating atmosphere. Under rotating frequency 1/1 day their theoretical size is πR/1460 or ~14 km in diameter. In fact their size is smaller, reaches about 8 km. This decrease also can be connected with their occurrence in the tropical zones with increased radius demanding decrease of sizes and masses of objects for decreasing the angular momentum. A consequence of this is increase of rotating speed with catastrophic results.

Recently discovered with help of infrared device (Yuno project, 2018,[1]) cyclonic chains around both poles of Jupiter might be compared with famous catastrophic terrestrial cyclones. Jovian cyclones make chains of 8 around the North Pole and 5 around the South Pole. In case of Earth 8 tectonic granules of the wave nature and πR/4 size encircle the planet along the equator (grand planet's ring). At the western Pacific hemisphere four of these granules are presented by a chain of cyclones in the atmosphere (Fig.3). An essential difference of the jovian and terrestrial chains is in their positions: on Earth it belongs to the longest equatorial ring, on Jupiter to a much shorter ring in high latitudes near to the North Pole. Another important difference is in relative sizes of the storms (Fig. 4). On Earth they are smaller (as if, squeezed), on Jupiter they are larger, more massive. The positions of both chains should explain this taking into account difference of their angular momentum. The equatorial belt with the larger angular momentum requires squeezing objects to diminish momentum, the high latitude zones with smaller radius and momentum require more massive objects. All this for equilibration of momenta in various zones of a rotating body. Significantly squeezed terrestrial equatorial cyclones are catastrophically rapidly rotating.

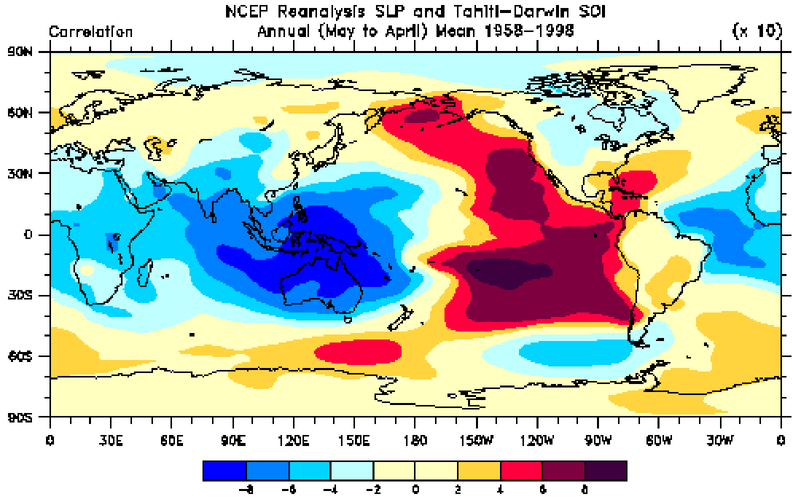
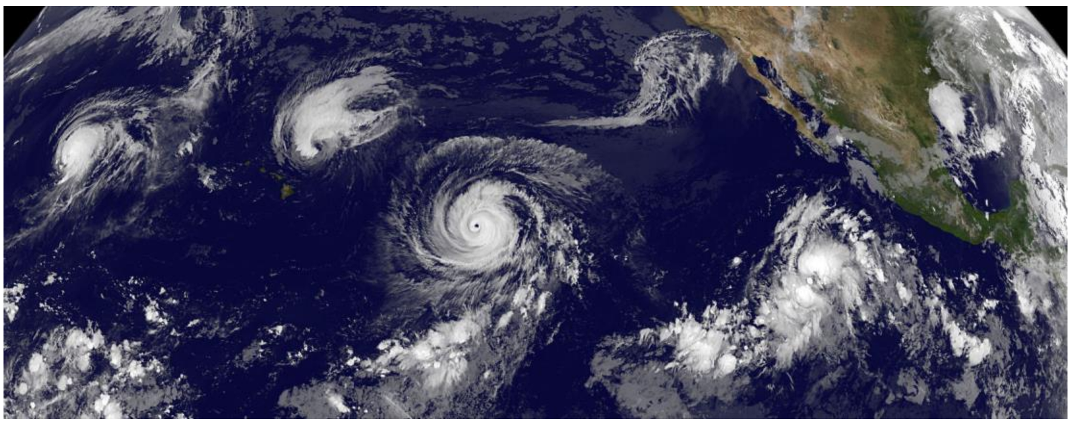


Fig. 1. High and low atmospheric pressures (many years observations) [1].

Fig. 2. Tornado in USA



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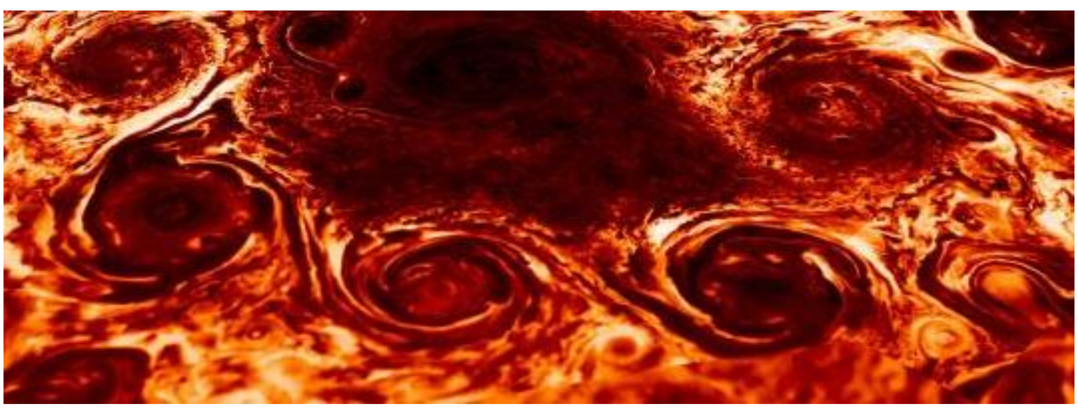

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Fig. 3. Cyclones on Earth. (over the Pacific). Fig. 4. Cyclones on Jupiter (North Pole) [2]

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