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Some regularities of the plate motion and distribution of epicenters of big earthquakes

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The general regularities in the motion of lithosphere plates and in spatial distribution of epicenters of the largest seismic events on the Earth surface in 20 century are investigated. Plates and earthquakes by the closest image are connected with each other. The seismicity is most brightly shown on boundaries of plates, and seismic belts (zones) determine these boundaries and configurations of the plates. On the other hand it is enough sure the parameters of global lithosphere rotation are determined (Greep, Gordon, 1990; Argus, Gordon, 1991; Barkin, 2000). The certain geometrical, kinematic and dynamic regularities of plate motion have been established (Barkin, 2000). The maximal tension at sliding of lithosphere and, accordingly, the strengthened accumulation of elastic energy and the most active displays of seismic activity should take place along the inclined equator of rotating lithosphere. Therefore we had the right to expect, that the pole **Pw** of the axis of global rotation of lithosphere, the pole **Pm** of the angular moment of relative motion of plates and the pole **Ps** of a planetary (most active) seismic belt should have a close positions to each other. Results of the fulfilled research have confirmed the made assumption. Thus, the global rotation of lithosphere organizes (in planetary scale) and directs seismic events, and its equator of rotation is set actually the position of a planetary seismic belts (zones) of the most active seismic events, as it is observed actually. The dynamic model of lithosphere plates and lithosphere with various powers of oceanic and continental areas (Barkin, 2000) has been used for analysis. Only surface displacements are considered in this model in accordance with known kinematical theories NNR-1 and HS-2 (Greep, Gordon, 1990; Argus, Gordon, 1991). The special computer method of axography (Ferrandez Garcia et al., 2002) has been used for determination of the most active poles (**Ps**) of latitudinal and longitudinal alignment in positions of epicenters of large earthquakes in

20th century (coordinates in degrees): 1) 65.5 S, 60.5 E. (the analysis of 112 largest earthquakes in 20th century); 2) 53.5 S, 45.5 E (392 earthquakes with M>7); 3) 54.5 S, 41.5 E (112 earthquakes); 4) 52.5 S, 56.5 E (392 earthquakes) etc. Various indexes of longitudinal (1), 2)), latitudinal (3)) and equatorial ordering (4)) (Ferrandez Garcia et al., 2000) have been used. The obtained coordinates of a pole of a seismic belt are coordinated with each other and with corresponding coordinates of the following poles (Barkin, 2000b): pole 49.0 S, 65.0 E of angular velocity of global rotation of lithosphere; pole 45.4 S, 57.6 E of the angular momentum of relative motion of lithospheres plates under theory HS2-NUVEL1; pole 48.1 S, 63.5 E of the angular momentum of global rotation of lithosphere. It is shown, that the vector of the principal moment of forces of inertia **Lo** of lithosphere (together with the Earth) is located in an equatorial plane and directed to descending node of seismic belt **Ws** (longitude 145.4 E). The centre of mass of lithosphere **Cl** with coordinates 41.0 N, 36.0 E is located near to the big seismic belt. The pole **Ps** is located on the other big seismic belt covering big northern arch of Pacific ocean, with ascending unit on equator (a longitude 105.0 E and an inclination about 55.0 degrees), up to seismic zones of South America. With poles of a vector of the moment of inertia forces of lithosphere, caused by the Earth rotation, the extended zones of active seismicity are connected. They form of the spirals located in the field of longitudes 90-180 E (spirals are twirled clockwise) and 270-360 E (are twirled counter-clockwise) with the general orientation in a direction the north - south. Their origin can be connected with the dynamic role of forces of inertia for non-spherical lithosphere. The moments of these forces and the corresponding motions of plates result in additional accumulation of elastic energy and influence on the spherical turns of plates. Three ring zones with the centers located on the basic seismic belt (with coordinates 30 N, 85 E; 15 N, 120 E; 5 S, 290 E) are marked. Ring zones are closely connected to arc zones on plate boundaries and it serves as the indication, that activization of seismicity and structure and position of ring zones are determined by the general mechanism.