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The comparative analysis of the seismicity in subduction and spreading zones.

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The aim of this work is to present the results of comparative analysis of latitudinal distributions of the earthquakes and released energy in subduction and spreading zones. In previous works authors carried out the analysis of EQ latitudinal distributions of a wide spectrum of seismic events on the material of the ISC catalogue (more than 250000 events with $M \geq 4$). However, comparative analysis of EQ latitudinal distributions and energy of events taking for subduction and spreading zones has not yet been undertaken. Because of the fact that most earthquakes are concentrated in the boundaries of lithospheric plates, we use for the analysis normalized value of earthquake number (and released energy) by length of the lithospheric plate boundaries in every single latitudinal belt. Such normalization gives us a power of the studied area of a plate boundary (average number of earthquakes generated per every 100 km of plate boundary), and allows us to compare seismic activity of latitudinal belts in various parts of the world. Below we use the term "density of the seismic events" (DSE) and "density of the energy" (DE) for the normalized values of the seismic events and the normalized energy released by EQs. The total number of studied events was subdivided into several subgroups by values of magnitude ranges (MRs: $4.5 \leq M < 5.0$; $5.0 \leq M < 5.5$; $5.5 \leq M < 6.0$; $6.0 \leq M$).

It was shown: seismic activity of the subduction zones is almost absent in the poles and in polar caps of the Earth, clearly expressed maximums in latitudes 30-45ºof the Northern and Southern Hemispheres, and the stable local minimum near the equator reveal. We carried out the analysis for stability of the obtained distributions in space and in time and all the noted peculiarities in distributions have remained. If we propose that the seismic events distributions have uniform features and obtained bimodal character of the EQ distributions is random fluctuations, then probability of the occurrence of obtained bimodal distribution (Pu) will be equal 0.0000001.

We took into consideration two spreading zones: in the Pacific and in the Atlantic Ocean. The analysis of the DSE distributions and the DE distributions for the spreading zones shows that these distributions varied insignificantly around average value for all MRs and latitudinal clustering practically absent. But it should be noted the existence of the local minimum in DSE distributions in latitudes 10-20ºS for the Pacific spreading zone. Also the local maximum near equator for the Atlantic spreading zone was detected for evens with $M \geq 5.5$. The Pu value for representative MRs (5.0-5.5; 5.5-6) in spreading zones varies from 0.44 to 0.996. For two dimensional distributions (over latitude and over depth) it was observed clearly expressed clusters in two depths levels: 0-30 km 30-60 km for practically all latitudes and all MRs.

Thus, the DSE distributions have different feature for the subduction and for the spreading zones. Therefore it may be proposed that on the latitudinal distributions in the subduction zones are effected the addition forces (inner or external), which do not influence on seismicity in spreading zones.