On the influence of the supposed global deep fault on the strong earthquakes in Indonesia

© 2023 A.V. Mikheeva[1], I.I. Kalinnikov[2]

[1]*ICM&MG RAS, Novosibirsk, Russia*; [2]*IPE RAS, Moscow, Russia*

Abstract According to the NEIC global catalog, out of 14 earthquakes with a magnitude of $M_S \geq 7.0$ registered in the world in the first six months of 2023, two belong to the powerful multi-earthquake of Turkey 06.02.2023 (*Mw*: 7.8 и 7.7), and the remaining 12 occurred in the Indonesian region. In the paper the geodynamic situation in the preparation of a series of Indonesian events, which began with two earthquakes: 08 and 09.01.2023 (M_S: 7.0 и 7.6, H=29 и 105 km), is investigated by means of a geoinformation system by means of a geoformation system GIS-ENDDB. It is established that all 12 earthquakes are spatially confined to the sub-latitudinal "Indonesian" seismolineament with a length of 9500 km, detected by the method of the great circle of the Earth. The dynamics of changes in the geophysical environment properties of the 950-kilometer zone from the axis of the lineament was estimated by the value of the paired correlation of magnitude M_S and creepex Cr_{0_ISC}. Two methods were used to calculate the coefficient of paired correlation of these parameters in a sliding time window: 1) with a fixed window size and 2) with one edge fixed at zero time (corresponding to the moment of the strongest Indonesian event on 09.01.2023). Both methods confirm the fact of monotonous consolidation of the environment along the lineament (evenly along its entire length and depth) 33 days before and 31 days after the strongest Indonesian shock: at the interval of reverse correlation ($|K_{KOR}| \geq 0.7$) of magnitude and creepex. The same pattern was previously described by us for the consolidated part of the earth's crust, where stronger earthquakes have a smaller creepex (characterizing the greater contribution of brittle destruction). Thus, the fact of the formation of an organized state of the environment (linear rigid structure) within the limits of the assumed deep fault, affecting the subsequent seismicity of the region in the form of a spatially timed semi-annual series of the strongest earthquakes with $M_S \geq 7.0$ is confirmed.

Keywords Mean-depth seismicity, creepex, the coefficient of paired correlation of earthquake parameters.

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Information about authors

Mikheeva Anna Vladlenovna, PhD, Researcher of the Institute of Computational Mathematics and Mathematical Geophysics, Siberian Branch of the Russian Academy of Sciences (ICM&MG SB RAS), Novosibirsk, Russia. E-mail: anna@omzg.sscc.ru

Kalinnikov Igor Ivanovich, PhD, Leading Researcher of the Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences (IPE RAS), Moscow, Russia. E-mail: i-kalinn@yandex.ru