

On temporary clustering of aftershocks and its dependence on the magnitude of main shock

Alexey Zavyalov (1), Anatoly Guglielmi (1), Oleg Zotov (2), and Ivan Lavrov (2)

(1) O.Yu. Schmidt Institute of Physics of the Earth RAS, Moscow, Russian Federation (zavyalov@ifz.ru), (2) Borok Geophysical Observatory of O.Yu. Schmidt Institute of Physics of the Earth RAS, Borok, Yaroslavl region, Russian Federation (ozotov@inbox.ru)

Experimental observations confirmed our previous prediction of a specific property of the aftershock flow, the essence of which is statistically significant clustering of seismic events in time during the first hours after the main shock in its epicentral zone [1, 2]. In the present study we confirmed the tendency of clustering of strong aftershocks during the first few hours after the main shock. It turns out that the quasi-period of repetition of grouping peaks is close to the theoretical estimate of the period of the round-the-world seismic echo (T about 200 min) which equals the travel time of the surface wave around the Earth, so that the surface wave returns to the epicentral region of the source. In the course of further analysis, we found a previously unknown property of aftershock flow, namely the dependence of the quasi-period mentioned above on the magnitude of the main shock. It was found that the higher magnitude of the parent earthquake, the shorter the quasi-period of grouping aftershocks (M-effect). The dependence of the quasi-period on the magnitude M partly explains the considerable variation in the distribution of peaks grouping of aftershock activity in time that was detected earlier. This result will be useful in the practice of prediction of strong aftershocks as well as in searching for the physical mechanisms of aftershock formation during the first hours after the occurrence of the main shock. This work was supported by Russian Foundation for Basic Researches, the project # 15-05-00491.

References:

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