

LARGE EARTHQUAKES OF CENTRAL ASIA BY REGIONAL DETERMINATIONS OF FOCAL MECHANISMS AND CBE SOLUTIONS IN THE INTERNATIONAL DATA CENTERS

Natalya Poleshko¹, Natalya Mikhailova²

The task of the present work was to compare the results obtained on reconstructing of tectonic stress field based on two different seismic methods applied to the same large earthquakes. The earthquakes with $M_s \geq 4.5$ included into the regional catalogue of focal mechanisms of Kazakhstan and CMT-catalogue of Harvard were selected for analysis. The time period is 1978-2013. It was noted that by the parameters of centroid moment tensor the pattern of strain-stress state of the earth crust, in whole, does not differ from that obtained by data of focal mechanisms of sources by standard method. However, there are some events that have significant difference in parameters characterizing the stress and plane of ruptures. Especially important are differences in dislocation types. According to CMT-catalogue all analyzed events relate to strike-slips or oblique-reverse faults. According to regional data there is earthquakes class of “normal fault” or “oblique-slip” type. The most interesting fact is that focal mechanisms absolutely different by two methods of determination relate to events that earlier were considered as abnormal by other independent characteristics. It was concluded that, possibly, the reason of difference in mechanisms can be due to the nature of events itself and inconsistency of the applied model with real processes in focal. For more complete characteristics of strain-stress state of medium it is necessary to use data of both methods as supplementing each other. Thus, mechanisms determinations by first arrivals allows to analyze wide energy range of events providing an opportunity to monitor not only the general pattern of regional field stress, but to reveal local zones of heterogeneity and observe its variations. CMT-catalogue data allow to reconstruct the regional stress field. The events for which the mechanism of main phase is absolutely different are the sign of abnormal physical conditions in focuses and, possibly, inform about preparation of larger events.

¹ Institute of Geophysical Research AEC MINT RK, Almaty, poleshko@kndc.kz

² Dr., Institute of Geophysical Research AEC MINT RK, Almaty, mikhailova@kndc.kz