ALGORITHM FOR CALCULATION OF SEISMIC MOMENT TENSOR OF STRONG EARTHQUAKES USING REGIONAL BROADBAND SEISMOGRAMS OF BODY WAVES

V.M. Pavlov, I.R. Abubakirov

Kamchatka Branch of the Geophysical Survey RAS, Petropavlovsk-Kamchatsky, 683006

The article presents an algorithm for estimation of integral parameters of a strong earthquake focus ($M_w > 8$) using broadband seismograms of body waves recorded within the range of epicentral distances from 500 to 3500 km. Besides, depth, duration, and seismic moment tensor were determined and estimated by means of minimization of relative sum of squared residuals. The seismic moment tensor is assumed to be of a double couple type. The real and synthetic seismograms are filtered in the period band of 100-300 seconds using the Batterworth filter of the 4th order. The synthetic seismograms are calculated for a plane layered isotropic weakly absorbed half-space. The algorithm was applied to the Tohoku earthquake 11.03.2011, $M_w = 9.1$. The obtained estimations agree with those from the GCMT catalog.

Keywords: seismic moment tensor, inverse problem, algorithm.