



Spectral estimation of source parameters for local earthquakes in the Pannonian basin

Bálint Süle and Zoltán Wéber

Seismological Observatory of HAS, Theoretical Dept., Budapest, Hungary (weber@seismology.hu)

Dynamic source parameters have been estimated for small, local earthquakes ($1.2 < M_L < 3.5$) occurred in Hungary in the period of 1995-2004. Fourier displacement spectra of P waves were calculated and analysed with respect to the ω^2 model of Brune. To get correct corner frequencies the spectra were corrected for near surface attenuation κ . The value of κ was determined by analysing the displacement spectra of events with short hypocentral distance, where the shape of spectrum is influenced by the near surface attenuation. The best-fitting Brune ω^2 models were found by applying a grid search method. The results of this method, the amplitude spectra levels, the corner frequencies and the frequency-independent quality factors were then used to estimate the dynamic source parameters. The source dimension ranged from 200 to 900 m, seismic moment from $6.6 \cdot 10^{11}$ to $3.48 \cdot 10^{14}$ Nm, stress drop from 0.13 to 6.86 bar and the average displacement was less than 1 cm for all the events. The scaling relation between seismic moment and stress drop indicated a decrease in stress drop with decreasing seismic moment. A linear relationship of $M_w = 0.71 \cdot M_L + 0.92$ was obtained between local magnitude and moment magnitude.