

RUPTURE PROCESS OF THE 1999 DUZCE , TURKEY EARTHQUAKE ESTIMATED FROM STRONG MOTION DATA

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12.11.1999 Mw:7.2 Duzce,Turkey Earthquake occurred on the Duzce fault and created surface rupture between Golyaka and Bolu Mountain. The rupture area is estimated to be approximately 15km by and 45 km, based on the surface rupture observations and the hypocenter location as well as its aftershock distribution.

A previous study done by using Empirical Green's Function Method (Irikura,1986) using strong motion waveforms in 0.3 - 10 Hz. shows an asperity of 17km x 11km at the center of the estimated rupture area. In the present study, this event has been investigated using the multi-time window linear waveform inversion procedure (Hartzell and Heaton, 1983).

16 strong ground motion records were provided from the permanent networks of ERD Ministry, Turkey and KOERI, BU, Turkey and temporary stations of IRIGM- France and LDEO, USA. All of those strong motion data were freely available on several web sites supplying earthquake data from worldwide earthquakes.

From available stations, 10 stations within 120 km epicentral distance were used in the analysis. Distribution of the strong motion stations provides good coverage especially on the western side of the fault rupture. Original acceleration records were integrated to the velocity, band-pass filtered in 0.1-1.0 Hz and resampled into 5.0 Hz.

Fault plane was subdivided into approximately 3km long, 3km wide subfaults. In order to calculate the theoretical Green's function between each subfault and each station in 1D velocity structure, the discrete wave number method of Bouchon (1981) together with the reflection-transmission matrix method (Kennett and Kerry, 1979) were used.