

Analysis of Tsunami Generated by the 1994 East Java Tsunami Earthquake

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A tsunami earthquake (Mw7.8) occurred off the south coast of Java Island, Indonesia on June, 1994. This earthquake generated a large tsunami. Average tsunami height of around 4-6 meter along the south coast of East Java and maximum tsunami height of 13 meter were measured by a field survey (Tsuji et al., 1995). Tsunami waveforms of this event were also recorded at two tide gauges in Cilacap, Central Java and Banyuwangi, East Java.

To simulate the tsunami propagation and inundation, Geoclaw model is used. Bathymetry dataset used for the simulation is assimilated from Indonesian Navy-chart, GEBCO 30 arc second, and topography data of Indonesian Geospatial Information Agency base-map with scale of 1:25.000.

The propagation and inundation is simulated using source model estimated by seismic data analysis of a previous study (Bilek and Engdahl, 2006). The simulation results were compared with the measured tsunami heights, inundation extents, and tsunami waveforms at the two stations. The seismic source model produced tsunami heights of only about 12% of the measurements. This mean that source model from seismic data could not explained tsunami heights along the coast.

Therefore, we try to add an additional source model which can explain tsunami heights and tsunami waveforms data. The additional fault model is located near the trench in the shallowest segment of subduction zone. The estimated source model produced tsunami heights of about 70% of the measured data.

Keywords: East Java Tsunami, tsunami earthquake, tsunami waveforms, tsunami heights