

ABSTRACT

INVERSION TOMOGRAPHY STUDY USING RAY TRACING SHOOTING STRAIGHTFORWARD FOR IDENTIFYING FRACTURE ZONE ASSOCIATED WITH FAULT AND SUBDUCTION ON NORTH OF SUMATERA

Yuniharti Khoirunisa
115.170.019

Northern Sumatera is an area that has high seismic activity due to the tectonic setting in Northern Sumatra. It is located in two seismically active zones, namely the subduction zone and fault zone consists of Sumatera Fault Zone, Mentawai Fault Zone, and West Andaman Fault. The existence of subduction zone and fault zone cause the Northern Sumatra area included to low zone area and potential earthquake hazard area due to the release of energy along the route.

Seismic distribution and tectonic analysis of an area can be carried out using seismic tomographic methods based on variations in the value of the P wave velocity below the surface. Data processing consists of 170 earthquake hypocenter data and 13 stations based on the IRIS earthquake catalog then it is calculated by the damped linear inversion based on the P-wave tomography seismic method using straightforward ray tracing shooting.

The result is a seismic tomographic cross-section showing the continuity of the fault zone and subduction zone of Northern Sumatera on depth of 10 km, 20 km, 21 km, 24 km, 30 km, 33 km, 35 km, and 38 km based on the AK-velocity model. The subduction zone and fault zone have a low $1/\Delta V_p$ value with values ranging from 10^{-7} - 10^{-8} based on logarithmic calculations. In the tomographic seismic section, the Sumatran Fault is represented by a red zone and has depth below 30 km also has a northwest-southeast direction of continuity. A low $1/\Delta V_p$ value indicates low structural density so it is suspected that it is directly related to the presence of low zone/fault zone.

Keywords: Shooting Straightforward, Sumatera Fault, Tomography Seismic.