

Multi-fault system of the 2004 Mid-Niigata Prefecture Earthquake by urgent aftershock observation

Shin'ichi Sakai[1]; Naoshi Hirata[2]; Aitaro Kato[2]; Eiji Kurashimo[2]; Takaya Iwasaki[3]; Toshihiko Kanazawa[4]

[1] Earthquake Research Institute, Univ. of Tokyo; [2] ERI, Univ. Tokyo; [3] ERI, Tokyo Univ.; [4] ERI, Tokyo Univ

A seismic network was deployed the day after the main shock of the 2004 Mid-Niigata Prefecture Earthquake to determine the major source faults responsible for the main shock and large aftershocks. Using the 5-day high-resolution seismic data, three major source faults are identified: two parallel faults dipping steeply to the west located 5 km apart, and the other dipping eastward and oriented perpendicular to the west-dipping faults. A 4-km eastward deviation in the routine locations is found in aftershock distribution as compared to locations by the temporary observation, which is due to a strong lateral change in velocity of the source area. The strong heterogeneity of the crust, related to the complex geological and tectonic evolution of the area, is considered to be responsible for the prominent aftershock activity following the 2004 Niigata event.