

Relationship between the geologic structure and source fault of the 2004 Mid-Niigata prefecture earthquake, central Japan

Hiroshi Sato[1]; Naoko Kato[2]

[1] ERI, Univ. Tokyo; [2] ERI

The 2004 Mid Niigata Prefecture earthquake (Mj 6.8) occurred in the Uonuma Hills, located in the active folding area of the eastern margin of the Niigata sedimentary basin. The geologic structure along the Uonuma Hills was examined based on the published geologic maps, drill holes and seismic reflection profiles and correlated to the seismogenic source faults obtained from the aftershock observations. Based on the style of geologic structure, the Uonuma Hills is divided into three parts along its strike. The southern part is marked by the west-dipping homoclinal structure produced by the reverse faulting of the west-dipping Muikamachi active fault. The central part shows the anticlinorium produced by the west-dipping reverse fault with a steep angle (60 degrees) below 5 km depth, and more shallowly (30 degrees) near the surface. This fault can be correlated with the source fault which generated the main shock. The northern part is characterized by mainly east-dipping faults and related folds. Thus, judging from the geologic structure, the 2004 Mid-Niigata prefecture earthquake ruptured possible maximum fault segment. The Muikamachi fault is estimated to have two different source faults in the northern and southern segments.