

Surface trace and geologic structure of the Kurehayama fault in the downtown area of Toyama City, north-central Japan

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The Kurehayama fault belt is an 35 km long, reverse fault running along the northwestern margin of Toyama Plain and the Hamakurosaki Spur, Toyama Bay. Since 1995, seismic reflection survey, drilling, trenching, and pit-excavation have been carried out along the central and southern segments of the fault. Although the surface trace of the master Kurehayama fault has been estimated by the previous studies, the underground structure in the downtown area of Toyama City remained uncertain. Therefore, the government of Toyama City had conducted seismic reflection surveys along three exploration lines in 2011-2012. This study re-examined those data of these survey lines and output into interpreted profiles in comparison to the acoustic profiles in the Toyama Bay area.

As for the urban Lines A and B, their terminations are located almost identical with the surface fault trace estimated from the tectonic landform, and the fault plane strikes N42°E and dips about 45°NW. While, Line C dose not illustrate clear fault in the shallow depth less than 200 meters. However, the deeper structure more than 200 down to 1100 meters a northwesterly dipping reverse fault was recognized to make a trishear-like monoclonal flexure. These features of Line C are almost consistent with those of Line 10M-A2 and Line 10M-1the former analytical results in the Toyama Bay area.

The previous reflection surveys on land areas revealed the shallow structures of the Kurehayama fault less than 500m in depth, while the coastal Line C did up to a depth about 2km in the urban area, and the master fault was located on the just extension of its bay-bottom fault trace. It can be concluded that the master fault is characterized by accompanying an asymmetric anticline or monocline flexure in both land and sea regions, especially along the segment from the downtown Toyama up to the Hamakurosaki spur.

Keywords: active fault, seismic reflection profile, Toyama Bay, Kurehayama fault, fault related fold, Toyama Plain