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S-wave seismic refletion profiling across the Horikawa fault, Nagoya central Japan

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A seismic reflection survey was made in Nagoya city, the Nobi Plain Chubu region. According to Sugito and Goto (2012), the Horikawa fault is an N-S striking, 10 km long, reverse fault located on the central Nagoya.

The survey line was carried out across the Horikawa fault. A S-wave handy vibrator seismic source (Geomatrix Earth Science Ltd, Elvis) and, a 24 channel seismic recording system (Seismic Source, DAQlink 3) was used for these surveys. The spread of the source and receivers was usually the split-spread type with the shot and receiver intervals being 1 meter. Maximum receiver-group offset was 48 meter. Single geophones of 30 Hz natural frequency were used. The sampling rate for all data was 1.0 msec. Sweep length and frequency selected 10 sec. and 20 - 80 Hz, respectively.

Field data were analyzed by using a general CMP Stack Method. Static correction was made by using the first arrival times based on the seismic refraction method, and predictive deconvolution was applied. Velocity analysis was carried out by constant velocity stack and velocity-spectrum method. The RMS velocity was picked up, and the interval velocities were calculated from the resultant RMS velocities. F-K migration was applied to the time sections.

The results of this study are summarized as follows:

The subsurface structure of the Horikawa fault was discerned in a buried fault zone and they form reverse fault.

Growing seismic strata was recognized in Holocene sediments.

Keywords: Horikawa fault, S-wave seismic reflecton profiling, Nagoya city, Active fault