

Seismic reflection survey across the coseismic surface ruptures of the 2014 nagano-ken-hokubu earthquake of Mw 6.2, central Japan

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The Nagano-ken-hokubu earthquake (Mw 6.2) struck Hakuba village, Nagano Prefecture, on 22 November 2014. A 9.2-km-long surface rupture appeared along the Kamishiro fault of the Itoigawa-Shizuoka tectonic line active fault system in association with the earthquake from Shiojima to Higasisano in Hakuba village. In this study, to reveal the subsurface structure of the focal area, we executed seismic reflection survey across the Kamishiro fault on 19-28 October 2015. The seismic line has a length of 4.2 km and started from the center of Kamishiro basin to Route 406 via Mikka-ichiba and Horinouchi. The roads along the seismic line were under repair due to the earthquake. We needed a lot of adjustments to the progress of road repairing.

The source used in this survey was Enviro Vib (IVI Inc.). Sweep length was 16 sec and sweep frequency range beginning at 10 Hz up to 100 Hz. The receiver was GS-20DX (natural frequency, 10 Hz; Geospace Inc.). The source interval was 20 m and the receiver spacing was 10 m, with 192 ch geophones used for each recording. We selected the Geode recording system (Geometrics) and its sampling rate is 1 msec.

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Keywords: seismic reflection survey, 2014 Nagano-ken-hokubu earthquake, Kamishiro fault, Itoigawa-Shizuoka tectonic line active fault system