

[JJ] Evening Poster | H (Human Geosciences) | H-TT Technology & Techniques

[H-TT19] New Developments in Shallow Geophysics

convener: Kyosuke Onishi (Public Works Research Institute), Kunio Aoike (Oyo corporation), Keisuke Inoue (国立研究開発法人 農業・食品産業技術総合研究機構, 共同), Tishiyuki Yokota (National Institute of Advanced Industrial Science and Technology)

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The session of shallow geophysics calls many research contributions on geophysical exploration techniques for the near surface. Our target depth is strictly restricted in the depth zone from 5 cm to 30 m (or from 2 in to 100 ft) below the surface of the ground. It may be the closest unknown territory for human society and advanced societies cannot have controlled yet to avoid disasters caused by dynamics in the shallow near surface. Peoples require techniques to manage levee, landslide and earth constructions also knowledge to control groundwater, liquefaction and soil pollution. The near surface has many geotechnical, environmental and hydrogeologic problems.

Major survey techniques are surface wave method, electric exploration, ground-penetrating radar and land streamer, but any methods will be discussed if your target is located in the specified depths. This session welcomes to discuss laboratory tests and rock physics for unconsolidated porous media in the vadose zone. Also, we will welcome not only cutting-edge technologies but also classic theory, if the knowledge is useful for human living.

[HTT19-P06] Very shallow S-wave seismic reflection survey across the surface rupture of 2014 Naganoken-hokubu earthquake, central Japan

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The Nagano-ken-hokubu earthquake (Mw 6.2) occurred on 22 November 2014. Along the pre-existing trace of the Kamishiro fault, a 9.2-km-long surface rupture emerged from Shiojima in Hakuba village of Nagano prefecture to Higashi-sano. In the northern part of the surface rupture zone, east-dipping reverse faults were identified as a master fault considered from distribution of surface rupture, amount of the vertical/horizontal displacement, ground deformation, morphological style, and deformation of artificial structure. On the other hand, buckled steel handrail and drainage gutter were observed in the southern part of the surface rupture zone, which suggest the low angle fault at shallow depth. Also, low angle thrust fault observed in the trenching survey (Okumura et al., 1998, J Seismol. Soc. Japan 2nd ser. Zisin, 50, 35-51).

In this survey, to reveal the subsurface structure of the northern part of the surface rupture, we conducted very shallow S-wave seismic reflection survey from November 21 to 23, 2016 at Oide in Hakuba village, Nagano prefecture. The length of seismic reflection survey line was 300 m from west to east across the 2014 surface rupture. To generate SH-waves in a direction perpendicular to seismic line, we hit a sidewall of square wooden log (0.2 x 0.4 x 1.0 m, 28 kg, pine wood) with a sledgehammer as a

source in this survey. The receiver was GS-32CT (natural frequency, 10 Hz), and sampling rate is 1 ms during 2 sec of recording time. The source and receiver spacing was 1 m with 96 ch geophones used for each recording. We selected the DSS-12 (Suncoo consultants co. Ltd.) for the recording system. In this presentation, we demonstrate the very shallow S-wave seismic reflection survey across the 2014 surface rupture along the Kamishiro fault in Oide of Hakuba village, Nagano prefecture.

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