

Estimation of shear-wave velocity structure by means of hybrid surface wave survey

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Hybrid surface wave survey is combined measurement of multichannel analysis of surface wave method (Active method) and linear array microtremor survey method (Passive method). Each dispersion curve at same CMP point, one of active survey is calculated by CMP-CC analysis and the other of passive survey is calculated by CMP-SPAC analysis, is combined to form single dispersion curve. This method has capability to reconstruct 2D S-wave structure up to 30 m or more.

Last year, we proposed a new passive seismic method utilized walking noises. In this study, we conducted hybrid surface wave survey to examine the applicability of a proposed method at PWRI tsukuba site. A total of 240 4.5 Hz geophones were set along a line at 2 m spacing. Active method recorded artificial waveforms generated by a sledge hammer hitting to the ground as usual. Passive method recorded not only microtremor but also noises generated by walking along the survey line. Compared with two dispersion curves at same CMP point, a high frequency part of dispersion curve showed almost same value. We reconfirmed that proposed method had capability to obtain dispersion curve on wide frequency band and evaluate shallow part of S-wave structure similar to active method.

Keywords: Hybrid surface wave survey, Shear wave velocity