Velocity Structure Exploration with Multimode Surface Wave From Ambient Noise

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It has been a hot topic in seismologic studies to get the velocity structures by ambient noise since the 21st century. However, previous studies always pay attention to the fundamental mode surface wave which can be obtained easily from the ambient noise but ignore the higher mode surface waves which are hard to extract. Recent studies have demonstrated that combining the higher-mode surface waves with fundamental-mode surface wave can greatly reduce the uncertainty when inversing velocity structures. As a result, it is becoming a vital issue to extract the higher-mode surface waves.

In this study, the Vector Wavenumber Transform Method (VMTM) based on spatial autocorrelation method has been applied to the NIED MeSO-net continuous waveform data to investigate the velocity structure of The Kanto Basin in Japan. It shows that VMTM can extract the higher-mode surface waves efficiently. Using the fundamental-mode dispersion curve as well as the higher-mode dispersion curves, we get the shallow structure of Kanto Basin in Japan by the Simulation Algorithm Method (SAM). At last, We discuss the velocity structure in the Kanto Basin In Japan and compare the structure with that in the previous studies.