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The tomography of the central Taiwan from ambient seismic noise correlation

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ABSTRACT
The central Taiwan is located at the active deformation front of the collision of the Eurasian continental plate and the Philippine Sea plate, which causes complex fold and thrust fault system in the area. The central Taiwan has been divided into two domains base on its distinct geological characteristics: the Chiayi and the Taichung domains. The Chiayi domain consists of active thrust faults, blind thrust and coastal plain. The Taichung domain comprises thrust faults and the Taichung foreland basin and tablelands. In this research, we present a study of surface wave dispersion using ambient seismic noise observed at 37 broadband stations deployed by the National Chung Cheng University (NCCUA) and the project called Broadband Array in Taiwan for Seismology (BATS) located in the central Taiwan. Vertical-component data recorded between 2004 and 2006 are correlated among stations to obtain Rayleigh-wave Green's functions. We filter these Green's function to obtain the Rayleigh wave group dispersion curves at periods of 5-20 seconds, using Hilbert-Huang transform technique. Thereafter, we calculate group velocity maps to construct 2-D shear-wave velocity model. The results show clear correlation with major geological structures, including the coastal plain and the Taichung Basin.