



Preliminary Image of Upper Mantle Structure Beneath the Korean Peninsula by Cross-correlation of Seismic Noise Data

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To image the upper mantle structure beneath the southern part of Korean peninsula, the reflection interferometry method was applied to seismic noise data recorded in 2014. The ambient noise recorded at 119 stations on the seismic network of the Korea Meteorological Administration was digitized at a 20-Hz sample rate. Each pair of noise traces was cross-correlated and then sorted into common cell gathers parallel to 294-km WNW-ESE and 335-km NNW-SSE refraction profiles shot in 2002 and 2004, respectively. The cell size was 60×1.5 km. To the cross-correlated data, conventional reflection processing techniques were applied. For normal moveout and migration, the IASP91 velocity model was used. Due to a scarcity of near-offset data, crust was poorly imaged shallower than 10 s. The sub-horizontal reflection event near 20 s correlates well with the chemical or thermal lithospheric base. Another subhorizontal event is evident near 30 s, which may indicate the base of seismic lid or tectosphere. Several steeper reflectors are interpreted as shear structures which allude to the past continental collisions. The seismic images in the stacked and migrated sections are well correlated with the previous ones yielded using virtual shot gathers from controlled-source data.