



Extraction of body waves from seismic ambient noise

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Ambient noise cross-correlation is used in seismology to obtain the part of the surface waves and applied to the theoretical researches and various experiments. Obtaining the part of body waves from the ambient noise correlation is difficult to recognize because of the feature decreasing body waves along the travel path. However, the travel times of body waves detected from temporal and spacial events occurrence involve uncertainty of the epicenter and accompany temporal-spacial restriction. On the other hand, ambient noise is always occurred and is obtained at the all stations. So it can be applied to research of the internal earth when the case of extracting the body waves using the cross-correlation is possible. This study shows that body waves can be observed by analyzing the ambient noise recorded seismic data in South Korea. Using 42 broad-band three components stations located on the South Korea. The data removed the mean and trend are filtered high-frequency band(0.5-2Hz). The noise correlations were calculated for all combinations of radial, transverse and vertical components, which required rotation of the horizontal components for each station pair according to the azimuth at each station of the great-circle between the two stations. Removing the part of broad-band signals effected by occurring event, the part of standard deviations more than three times are removed. And it applied spectral whitening to reduce effects of the surface waves. After data processing, all ambient noise signals are cross-correlated and temporal stacked. We found the signals propagating from one station to another station, this signals can be interpreted as the body waves distinguished surface travel-time in high-frequency band. From this analysis, we can extract the body waves using ambient noise cross correlation of continuous data at the stations.