Detection of converted phases from the upper mantle discontinuities using teleseismic body-wave microseisms

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<!--?xml version="1.0" encoding="UTF-8" standalone="no"?-->A seismological method using earthquakes is feasible for exploring the Earth’s deep interior. In ten years, seismic interferometry (SI) has been developed. Although, in the first stage, surface wave part was focussed, body wave part has been utilized in these years. For an appropriate reconstruction of Green's function by SI, equipartition of energy is required. However, the assumption is valid under only limited situations. Recent observations of teleseismic body-wave microseisms showed localized sources, which prevent from appropriate body wave retrievals using SI.
In this study, we have a different stradegy from SI for detections of converted phases from the upper mantle discontinuities. Using centroid locations of body-wave microseisms, we can apply a receiver function analysis as in an earthquake. The difficulty is that the signal is not transient but persistent. With a help of array analysis, we can infer source time function for the equivalent vertical single force at the centroid. Deconvolution of a slant stack time series of radial components by the source time function emphasizes P-SV conversion phases at upper mantle discontinuities beneath the stations. We apply this method for 779 Hi-net stations on Dec. 9th, 2014 when a weather bomb hit north Atlantic ocean. A preliminary analysis shows clear P660s. We will discuss the accuracy of the detected phases in a more quantitative manner.

Keywords: microseisms, ambient noise, array analysis

