Surface-wave retrieval from ambient-noise observations using crosscorrelation and multidimensional deconvolution

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The crosscorrelation of ambient-noise observations of two different seismic receivers is known to yield an approximation of the Green's function as if one of the receivers were a source. We apply this principle to field observations collected at two seismic arrays in southwestern USA: the RISTRA array and the CDROM array. We use especially responses from noise sources lying at the North Pacific Ocean. We will show results containing clear evidence that surface waves can successfully be retrieved from these observations in both the single-frequency and double-frequency microseism bands.

We will also show the result of multidimensional deconvolution of the retrieved Green's function by the so-called point-spread function. We compute this function from the ambient-noise field to quantify the smearing of the virtual source in space and time due to the lack of equipartitioning of the noise sources. The deconvolution process is known to partially correct for this lack of equipartitioning and might thus increase the accuracy of the retrieved Green's function.