



Imaging regional heterogeneities from seismic coda of array records

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Seismic coda is composed of wavelets scattered from various heterogeneities. It is usually difficult to identify the origins of scattered wavelets with a single record. We introduce a method to image regional heterogeneities from seismic coda of array records. Coherent scattered waves that are recorded in an array are collected using directional beamformings. The locations of the heterogeneities can be calculated by a back-projection scheme based on beamforming direction, traveltime and slowness. We analyze regional seismic records in central Asia and western North America. The illuminated locations of heterogeneities are correlated with structural variations such as surface topography, crustal thickness and sedimentary thickness. The influence of the structural variations on seismic waves is quantified in terms of scattering intensity and quality factor. The proposed technique may be useful for a study of regions with sparse ray-path coverage.