

Solid Earth Physics Seminar, Harvard University

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Room 209 Pierce Hall, 29 Oxford St, Cambridge

***Passive Imaging Beyond
Surface Wave Tomography***

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Abstract:

We discuss recent results concerning noise based imaging with body waves and scattered waves at different scales. At the global scale, we analyze the teleseismic correlation field which exhibits various kinds of arrivals, apparently corresponding to the actual body wave phases. We recall the theoretical arguments for the reconstruction of the Green function from field correlation, and the specific issue of global propagation and sources at the free surface. We illustrate the discussion with the long period range where the contributions of the Earth free oscillations can be identified.

At short periods, when the scattering is effective, the scattered waves could also be retrieved and used for imaging at small scale. The correlations exhibit weak localization, a subtle mesoscopic effect related to self interference, that was first described in optics and that is a signature of diffuse fields that cannot be observed with earthquake data for symmetry reasons.

We present examples showing that the opportunities offered by continuous seismic record analysis for imaging and temporal monitoring extend far beyond surface wave tomography.