

(quasi)-Love Found in Tuscany: US-European Seismic Array in Italy Catches the Big Wave

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A linear PASSCAL array across the northern Apennines was deployed in Fall, 2004. Waveforms from the Sumatra-Andaman earthquake arrived at the array from due East (red lines on the map), yielding naturally polarized records (below are data from the crest of the Apennines). Record sections along the array show clear distortions of the Love wavefield. In the time window of the Love wave a vertically polarized phase (purple dots, upper right plot) appears on records from all sites in Tuscany, west of the Apennines. This phase is likely a Love-to-Rayleigh converted wave, or quasi-Love wave. It originates most readily from lateral gradients in seismic anisotropy structure. Given raypaths' geometry, its appearance in only Tuscany suggests an association of the anisotropic gradient with descent of Adriatic lithosphere beneath the Apennines. Love wave deflection onto the east component, both within the Apennines, and on the island of Elba (green ovals, lower right plot), is likely associated with complexity in upper mantle structure in Tuscany.

All time series are low-pass filtered at 100 seconds.

