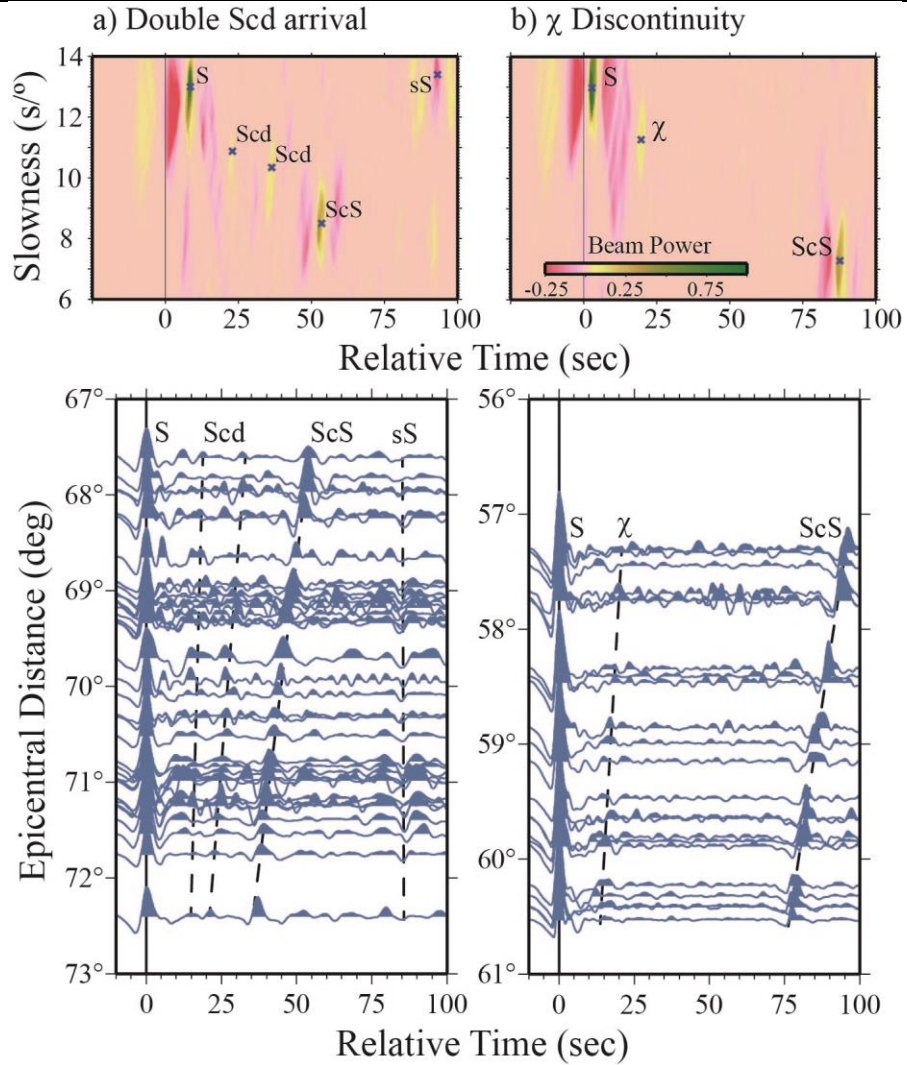


Seismic Array Processing of Earthscope Data

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Arrays of seismic instruments were originally deployed beginning in the 1960's consisting of short-period vertical component sensors designed to analyze P-wave data for detecting nuclear tests. Subsequently, data recorded at these arrays have been used in a variety of studies to examine seismic arrivals from the deep Earth. Although many of these arrays currently have three-component sensors few efforts have utilized the extra components in an array processing sense. Here we present results from several recent studies using broadband arrays composed of subsets of Earthscope Transportable Array (TA) and Flexible Array (FA) data. We present results that analyze the D" discontinuity structure beneath the North Atlantic, demonstrating the existence of a discontinuity in this location with an average height above the core-mantle boundary of 304 ± 14 km that terminate abruptly at the easternmost edge of our study region. This abrupt termination may be consistent with sampling the easternmost edge of the subducted Farallon plate. Furthermore we present results on D" discontinuity structure beneath Central America. Here we find a discontinuity with an average height of 297 km. However, strong topography is inferred in this location with over 150 km of relief on the discontinuity. Topography is confirmed by the detection of multiple Scd-like arrivals that interact with the discontinuity at the strongest gradients in topography. In addition we discuss preliminary array processing results for ultra-low velocity zone and upper mantle structures.



(a) Vespagrams and waveforms for event: 200907120612 showing a double *Scd* arrival and b) event: 201111221848 showing an arrival (χ) that has an inferred height 730 km above the CMB. The waveforms and vespagrams are aligned and normalized to unity on the direct *S*-wave arrival.