Abstract Submitted
for the 4CF17 Meeting of
The American Physical Society

Constraining Mantle Discontinuity Structure Beneath North America ANDREW EAGON, New Mexico State Univ — The Earth's mantle consists of discontinuities arising from abrupt changes in mantle mineralogy, a common example of which is a mineral phase change; there are two notable mineral phase changes that occur near the depths of 410 km (α-olivine to β-spinel) and 660 km (γ-spinel to perovskite+magnesiowustite). The variable depth of these discontinuities is tied to thermal properties of the mantle as well as compositional variations. Therefore, it is possible to use depths of observed discontinuities to infer temperature using the Clapeyron slope of the phase change. Thanks to EarthScope's continent-wide coverage, it is feasible to use array methods, such as vespagrams, to detect specific seismic phases that have interacted with discontinuities. The ScS reverberative family – a group of S waves reverberating between the surface and the core-mantle boundary and interacting with mantle discontinuities along the way – offers some of the strongest constraints on Earth's deep interior. In this study, we analyze ScS reverberations from events located near or within the continental US and recorded by EarthScope arrays, to calculate the depths of upper and mid-mantle discontinuities. We discuss the depths of the discontinuities in the context of temperature variations and their relationship to other constraints on the structure of the sub-continental mantle beneath North America.

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Date submitted: 20 Sep 2017 Electronic form version 1.4