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Shear wave splitting in the core-mantle boundary region from the MOMA array

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The goal of this study is to evaluate the geometry and strength of shear wave anisotropy that exists within D", the 200-300 km of the mantle located just above the core-mantle boundary (CMB). This study utilizes shear phases that diffract along the CMB (*Sdiff*) and provide unique information about the structure of the core-mantle boundary region and D". Waveforms used in this study were recorded by the Missouri-Massachusetts broadband seismometer deployment (MOMA), a 20-station IRIS/PASSCAL array that extended across the eastern U.S. and was specifically designed for studies of the CMB.

We have performed a preliminary analysis of differential travel times for the radial and transverse components of *Sdiff* (*SVdiff-SHdiff*). Phases studied to date traverse two regions of the CMB: a wide N-S swath located beneath the southern border of Alaska, and a narrow NE-SW strip beneath the central Pacific Ocean east of Hawaii. Regions south of Alaska are sampled by phases from deep (>590 km) events in the Mariana subduction zone, limiting the effects from source-side upper mantle anisotropy. These phases exhibit very small delays between *SVdiff* and *SHdiff* (≤ 2.0 s), and do not demonstrate a consistent pattern in the sign of *SVdiff-SHdiff*. Regions beneath the central Pacific are sampled by phases from shallow (33-50 km) events in the Tonga and New Hebrides subduction zones. While the possibility for contamination from source-side upper mantle anisotropy exists, the downgoing legs of *Sdiff* from each event to the array follow very similar paths, thus the effect of source-side anisotropy would be nearly identical for all stations. Phases from each event exhibit a large range of delays (0.1-6.5 s) and exhibit rapid variations in the sign of *SVdiff-SHdiff*. The preliminary results suggest the existence of azimuthal anisotropy in D" over this region. To evaluate the effect of splitting due to receiver-side upper mantle anisotropy, we corrected waveforms using individual station parameters that describe shear wave splitting. These corrections reduce *SVdiff-SHdiff* values by no more than 0.75 s, indicating that receiver-side splitting is not a primary cause of the observed *SVdiff-SHdiff* times.

We are in the process of modeling these data using reflectivity synthetic seismograms, as well as evaluating *SVdiff/SHdiff* amplitude ratios, assessing the effects of dispersion, and expanding our data set to probe other regions of D". Determination of the form of anisotropy in D" will help determine mantle structure and dynamics near the CMB, hopefully elucidating the fate of subducted slabs and the character of mantle convection at the base of the mantle.