ID: Type: **Poster**

-Scale Joint Body and Surface Wave Tomography with Vertical Transverse Isotropy for Seismic Monitoring Applications

We continue to develop more advanced models of Earth's global seismic structure with specific focus on improving predictive capabilities for future seismic events. Our most recent version of the model combines high-quality P and S wave body-wave travel times and surface-wave group and phase velocities into a joint (simultaneous) inversion process to tomographically image Earth's crust and mantle. The new model adds anisotropy (in the form of vertical transverse isotropy) to the model, which is necessitated by the addition of surface waves to the tomographic data set. The explicit Earth model design allows for accurate travel time computation using our unique 3D ray tracing algorithms, capable of ray tracing more than 20 distinct seismic phases including crustal, regional, teleseismic, and core phases. Thus, we can now incorporate certain secondary (and sometimes exotic) phases into source location determination and other analyses. New work on model uncertainty quantification assesses the error covariance of the model, which when completed will enable calculation of path-specific estimates of uncertainty for travel times computed using our previous model (LLNL-G3D-JPS), which is available to the monitoring and broader research community and for which we encourage external evaluation and validation.

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