

Neutrino Tomography with 3D Earth Models

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(REMOTE)

Neutrinos can be used to study the interiors of various objects that are difficult to fully probe by classical means. In the case of the Earth, they provide complementary information to seismic waves because of the imprint of matter effects on their oscillations. This alternative approach may bring new insights on open questions regarding the composition, structure, and dynamics of the deep Earth. Though seismic wave data has been uncovering large asymmetric features inside the Earth, neutrino simulations have largely kept using a spherically symmetric Earth model. This is problematic if we want to use neutrinos to help disentangle various properties of matter in Large Low-Shear-Velocity Provinces (LLSVPs), for example. In this contribution, I will be talking about how to expand simulations from using this effectively 1D Earth model into using a full 3D Earth model, allowing for asymmetries inside the Earth. I will specifically focus on how we did that with OscProb, a C++ programming library for calculating neutrino oscillation probabilities.

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