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# Validating Layered Structure Inside Earth Using Atmospheric Neutrino Oscillations at IceCube DeepCore

*Tuesday 15 October 2024 18:00 (15 minutes)*

The IceCube DeepCore detector, with its denser central arrangement, can detect sub-GeV atmospheric neutrinos. The oscillation pattern of neutrinos is altered due to interactions with ambient matter as they travel. The changes in these patterns are influenced by the amount of matter and its specific arrangement. As neutrinos propagate, they retain information about the densities they encounter. Our study demonstrates that IceCube DeepCore can utilize the Earth's matter effects to distinguish between a homogeneous matter density profile and a layered structure density profile. In this talk, we show that using 9.3 years of IceCube DeepCore data, IceCube DeepCore rejects the homogeneous matter density profile with a confidence level of 1.4⊠. Additionally, we will discuss the potential improvements in Asimov sensitivity with the upcoming IceCube Upgrade, an extension of the IceCube DeepCore detector setup.

## Track type

Neutrino Physics

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