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Earth Tomography Results Using High-Energy Atmospheric Neutrinos at IceCube

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The IceCube Neutrino Observatory has selected a sample of very pure, primarily atmospheric, predominantly muon neutrino events over 11 years from all directions below the horizon, spanning the energy range 500 GeV to 100 TeV. These neutrinos traverse the earth and are attenuated in varying amounts depending on their energy and traversed column density. By parameterizing the earth as multiple constant-density shells, IceCube can measure the upgoing neutrino flux as a function of the declination, inferring the density of each shell. In this talk, we present the results of a Bayesian analysis using this approach, including measurements of the Earth's density profile, mass, and moment of inertia. In addition, the analysis procedure, details about the data sample, and systematic effects are also discussed. This analysis represents the latest, weak-force driven, non-gravitational measurement of the earth's density, mass, and moment of inertia.

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