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## Ultra-High-Energy Tau Neutrino Cross Sections with GRAND and POEMMA

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Next generation neutrino experiments will push the limits in our understanding of astroparticle physics in the neutrino sector to energies orders of magnitude higher than the current state-of-the-art high-energy neutrino experiment, IceCube. These experiments will use neutrinos to tell us about the most extreme environments in the universe, while simultaneously leveraging these extreme environments as probes of neutrino properties at the highest energies accessible in the foreseeable future:  $E \sim 10^9$  GeV. At these energies neutrinos are readily absorbed in the Earth. Assuming an isotropic distribution, by looking at how the flux varies as a function of angle through the Earth, we show that it is possible to extract the  $\nu_\tau - N$  cross section with precision at the  $\sim 20\%$  level ( $1\sigma$  assuming Wilks' theorem) given  $N_{\text{events}} \sim 100$  events.

### Preferred track

Cosmic Rays and Astrophysics

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