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## The prospects of Earth tomography with TRIDENT

Recent studies have demonstrated the feasibility of Earth tomography using high-energy atmospheric neutrinos. High-precision geophysical models are essential to unravel Earth's evolutionary history. The prevailing Preliminary Reference Earth Model (PREM) was established using traditional geophysical methods to determine the matter distribution throughout the Earth. The model however carries relatively large uncertainties. Neutrino-based tomography provides a unique probe deep into the Earth's structure, particularly the core where PREM uncertainties are most pronounced. The TRopIcal DEep-sea Neutrino Telescope (TRIDENT) is a next-generation neutrino observatory located in the South China Sea. This work establishes a framework for quantifying the uncertainties in neutrino-based tomography and highlights TRIDENT's potential to advance our understanding of the Earth's matter composition.

## Collaboration(s)

TRIDENT collaboration

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