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Atmospheric Neutrino Oscillations at Super-Kamiokande

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Spanning several orders of magnitude in both neutrino energy and path length, atmospheric neutrinos are a versatile probe of both standard and exotic mixing scenarios.

Indeed, recent measurements of θ_{13} by reactor antineutrino experiments have opened up the possibility to observe the effect of the earth's matter on neutrino oscillations and to subsequently determine the neutrino mass hierarchy using atmospheric neutrinos.

Further, the existence of a sterile neutrino outside of the standard three-neutrino oscillation paradigm would produce observable distortions in the atmospheric neutrino flux that can be used to probe hints from short-baseline oscillation experiments supporting an additional neutrino. Atmospheric neutrinos can similarly be used to explore possible deviations from Lorentz invariance and are particularly sensitive to violations of this symmetry that induce oscillation effects that scale with the neutrino energy and path length.

The latest results from searches for each of these phenomena using Super-Kamiokande atmospheric neutrino data will be presented.

Collaboration

– not specified –

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