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Atmospheric neutrino oscillations with Super-Kamiokande and prospects for SuperK-Gd

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The Super-Kamiokande (SK) experiment is a 50 kton water-Cherenkov detector located in Kamioka, Japan. With its 40% photocoverage, it has been collecting data since 1996 and is responsible for the very first observation of neutrino oscillations through the analysis of atmospheric neutrinos. Nowadays, the atmospheric neutrinos measurements of the SK experiment keeps providing some of the most precise measurements for neutrino oscillation parameters such as θ_{23} , the neutrino mass ordering, Δm^2_{32} , and, to a lesser extent, the δ_{CP} phase.

In this presentation, an overview of the most recent atmospheric neutrino oscillation analysis results will be given, as well as, a glimpse of what is to come, concerning atmospheric neutrinos, in the recently started Gd-doped phase of the detector. This detector upgrade (SuperK-Gd), provides an efficient neutron tagging via Gd-neutron capture, potentially enhancing the sensitivity of the atmospheric neutrino oscillation analysis.

Collaboration name

Super-Kamiokande

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