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Three flavor neutrino oscillation analysis of atmospheric neutrinos in Super-Kamiokande ROGER WENDELL, Duke University, SUPER-KAMIOKANDE COLLABORATION — The nature of the neutrino mass hierarchy and the possibility of a nonzero θ_{13} are open problems in neutrino physics that can be probed by extending the standard two-flavor neutrino oscillation scenario to include all active flavors. In a three-flavor oscillation scheme there is known resonant enhancement (suppression) of the $\nu_\mu \to \nu_e$ transition probability in matter for several GeV neutrinos at long baselines for a normal (inverted) hierarchy when $\theta_{13} > 0$. This effect is not present for the corresponding anti-neutrino transition. The Super-Kamiokande I atmospheric data has been analyzed using a three-flavor model testing both the normal and inverted mass hierarchies and has found no significant change in flux in its enriched multi-GeV ν_μ or ν_e samples. Accordingly, confidence intervals for the atmospheric oscillation parameters have been obtained, the best fits being consistent with previous atmospheric results and zero θ_{13} for both hierarchies.

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