

論文内容の要旨

論文題目：

Full three flavor oscillation analysis of atmospheric neutrino data
observed in Super-Kamiokande

(スーパーカミオカンデで観測された大気ニュートリノデータを
もちいた3世代ニュートリノ振動解析)

氏名： 石原 千鶴枝

This thesis presents the neutrino oscillation studies considering entire oscillation parameters, two mass differences Δm^2_{12} , Δm^2_{23} , three mixing angles, θ_{12} , θ_{23} , θ_{13} , and one CP phase parameter (δ_{cp}), by the atmospheric neutrino data observed in Super-Kamiokande.

The Super-Kamiokande, a 50 kt water Cherenkov detector, started taking data in 1996 and has been observed a large number of atmospheric neutrino events. About 3,000 day neutrino data is collected through the data taking phases, Super-Kamiokande-I, II and III. This analysis is performed using the amount of this data for the first time.

The neutrino data selection and observed data quality for the analysis are summarized in this thesis. The analysis examines both the normal and inverted mass hierarchy cases. In the normal (inverted) mass hierarchy case, Δm^2_{23} , $\sin^2\theta_{23}$ and $\sin^2\theta_{13}$ are constrained at 90% C.L. to $1.87 (1.97) \times 10^{-3} < \Delta m^2_{23} < 2.74 (3.12) \times 10^{-3} \text{ eV}^2$, $0.409 (0.432) < \sin^2\theta_{23} < 0.632 (0.647)$, $\sin^2\theta_{13} < 0.067 (0.124)$. All CP phase values are allowed at 90% C.L.