

ICEHAP Seminar
2014年9月5日(金)午後2:00~
会場:理学部2号館209先進会議室

講師:石塚正基氏
(東京工業大学)

**"Improved measurements of theta13 and
reactor energy spectrum by the
Double Chooz experiment"**

要旨/abstract

Improved measurements of the neutrino mixing angle θ_{13} from the Double Chooz experiment will be presented. Double Chooz updated the measurement recently using the data collected in 467.90 live days by the far detector positioned at a distance of 1050m from Chooz reactor cores in France. We have developed several novel techniques to reduce the backgrounds and systematic uncertainties with respect to the previous publications. In contrast the efficiency of the reactor neutrino signal has increased. The background rate is directly measured by one week of the reactor-off data to be consistent with the estimation. The value of θ_{13} is measured from a fit to the observed energy spectrum.

In addition, deviations from the reactor antineutrino prediction were observed above the prompt signal energy of 4MeV and the same feature was confirmed later by other reactor neutrino experiments. Possible explanations of the prediction are also presented.

A consistent value of θ_{13} is obtained from a fit to the observed rate as a function of the reactor power independently of the spectrum shape and background estimation, demonstrating the robustness of the θ_{13} measurement despite the observed distortion.