Contribution ID: **278** Type: **Poster reactor**

Background-independent measurement of θ13 in the Double Chooz experiment

Reactor experiments have successfully measured the θ_{13} mixing angle by studying the neutrino deficit as a function of the prompt visible energy. Among these, Double Chooz is unique due to the experimental configuration that features only two reactors. Taking advantage of this fact, the Reactor Rate Modulation (RRM) analysis classifies the neutrino interactions according to three reactor configurations: both reactors are running, only one reactor is on or both reactors are off. This last scenario allows for a direct and independent measurement of the total background rate of the experiment. A global fit to both θ_{13} and the total background is performed by analysing the neutrino candidates rate for different reactor power states. The results yield a competitive measurement of θ_{13} and an independent estimation of the total background rate, consistent within one sigma with the background model used as an input for the Rate+Shape fit

Authorship annotation

On behalf of the Double Chooz collaboration

Session and Location

Wednesday Session, Poster Wall #205 (Ballroom)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)