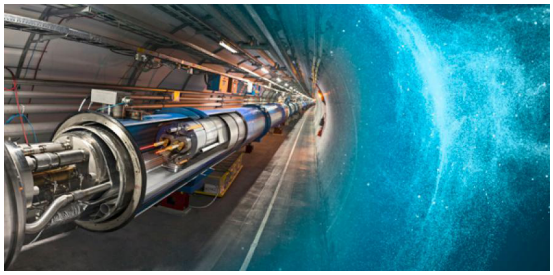

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Study of muon-induced background in Double Chooz neutrino oscillation experiment.

Tuesday, 22 March 2022 16:00 (15 minutes)

The Double Chooz experiment is a reactor antineutrino disappearance experiment located on the site of the Chooz nuclear power plant in the Ardennes region in France. The principal aim of the experiment is a high precision measurement of the oscillation amplitude sin2 2θ13 of the antineutrinos emitted from the two reactor cores of the Chooz power plant. The robustness and accuracy of this measurement depends strongly on a precise knowledge of the rates and spectral shapes of the backgrounds that contaminate the antineutrinos selection over the neutrino oscillation expected region. We study the muon induced background in the Double Chooz experiment. Indeed, cosmic muons crossing the detectors or interacting in the neighborhood constitute the main source of background events encountered in Double Chooz. Dedicated identification techniques have been developed ton tag each of these backgrounds and, consequently, the associated spectral shapes and rates have been determined. The values obtained in our work serve as inputs in the final fit whence the θ13 value is extracted. The latest measurement released by the Double Chooz collaboration is sin^2 θ13 = 0.119 ± 0.016.

Primary author: Dr KALE SAYI, Kenny

Presenter: Dr KALE SAYI, Kenny

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