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Atmospheric muon-induced background study for the Double Chooz experiment

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Atmospheric muons represent an important background for neutrino oscillation experiments such as Double Chooz. They can cross the detector, depositing a great amount of energy, or decay after a few centimeters, depositing just enough energy to be miscounted as a neutrino interaction, or even trigger in the surrounding rock a shower of fast neutrons that can interact in the detector, mimicking a neutrino signal. Although solutions exist to veto out crossing muons with a near 4π coverage, the geometry of Double Chooz detectors allow some muons to decay into the active detection volume. I will present a study aiming to reduce this background based on the likelihood of the event reconstruction algorithm. I will also present DCTPC, a neutron TPC developed to provide a directional measurement of the fast neutron flux in Double Chooz detector halls. This measurement will allow us to further constrain Double Chooz's model of fast neutron background.

Based on work done with Adrien Hourlier, Jaime Dawson

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Classification de Session: Poster session