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## The Double Chooz Neutrino Experiment

The Double Chooz Experiment utilizes electron anti-neutrinos produced in the Chooz nuclear reactor in Northern France. The goal of the experiment is to measure the last unmeasured parameter in the neutrino mixing matrix. Double Chooz is a second generation experiment that utilizes two detectors located at different distances from the nuclear reactor. The two detectors are identical, and they are only sensitive to electron anti-neutrinos. By counting the number of neutrinos interacting in the near detector and counting the number of neutrino interacting in the far detector we can find the number of neutrinos that have oscillated to other flavor states.

Here at Columbia, we have been working on design of a new detector component, the Outer Muon Veto. One of the major sources of background within this experiment is the false signal created by cosmic muons. In order to better deal with this background, we use a muon veto that detects when muons are passing through our detector, or the surrounding rock. This allows us to distinguish true signals from background signals.

In this talk, I will present a general introduction to neutrino physics and to the Double Chooz project in general, and explain the work I have been doing here at Columbia for the past two years.