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Title: IBD directionality measurement at the Double Chooz Experiment:

The Double Chooz experiment is a reactor neutrino experiment in Chooz, France. The main purpose of the experiment is to measure the neutrino mixing angle θ_{13} . There are two reactor cores at a short distance in the Chooz nuclear power plant. Double Chooz has two liquid scintillator detectors, the Near detector and the Far detector, located at distances of 400 m and 1050 m from these reactor cores. The far detector has taken data since 2011 and the Near detector started to take data in 2014.

A liquid scintillator detects reactor electron anti-neutrinos by using the inverse beta-decay (IBD). IBD produces a positron and a neutron. The positron reacts immediately while the neutron signal occurs late, upon capture on a nucleus.

These two events provide time and position coincidence allowing to suppress backgrounds significantly. In addition, these two signals provide some direction information of the incoming neutrinos by using spacial information of events. The exploitation of the IBD directionality information might allow to enhance physics capabilities in liquid scintillator detectors in cases such as core-collapse supernova neutrinos and geo-neutrinos, mainly. Thanks to Double Chooz's simple setup with two reactor cores, the precise study of the IBD directionality capability can be done. This is unique environment in the world. In this seminar, the method of the measurement of the direction with IBD events and the result with the latest Double Chooz data will be shown.