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Double Chooz Neutron Detection Efficiency with Calibration System PI-JUNG CHANG, Kansas State University, DOUBLE CHOOZ COLLABORATION — The Double Chooz experiment is designed to search for a non-vanishing mixing angle theta13 with unprecedented sensitivity. The first results obtained with the far detector only indicate a non-zero value of theta13. The Double Chooz detector system consists of a main detector, an outer veto system and a number of calibration systems. The main detector consists of a series of concentric cylinders. The target vessel, a liquid scintillator loaded with 0.1% Gd, is surrounded by the gamma-catcher, a non-loaded liquid scintillator. A buffer region of non-scintillating liquid surrounds the gamma-catcher and serves to decrease the level of accidental background. There is the Inner Veto region outside the buffer. The experiment is calibrated with light sources, radioactive point sources, cosmics and natural radioactivity. The radio-isotopes sealed in miniature capsules are deployed in the target and the gamma-catcher. Neutron detection efficiency is one of the major systematic components in the measurement of anti-neutrino disappearance. An untagged 252Cf source was used to determine fractions of neutron captures on Gd, neutron capture time systematic and neutron delayed energy systematic. The details will be explained in the talk.

Pi-Jung Chang
Kansas State University

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