



Contribution ID: 319

Type: **Poster**

The Stereo Project

Recent work on the reactor neutrino flux prediction, and the re-analysis of former short baseline experiments that followed, revealed the so called reactor anti-neutrino anomaly. The observed deficit of detected rates could be interpreted as an oscillation toward a new neutrino state, triggering thus a new interest for the search of light sterile neutrinos. The Stereo project aims to evidence—or discard—such a short baseline oscillation near the ILL research reactor (Grenoble, France) by the observation of an E/L dependent distortion induced in the energy spectrum, typical of such a phenomenon. The Stereo detector consists of six identical cells filled with gadolinium loaded liquid scintillator in which neutrino interactions are identified through the inverse beta decay. This fiducial volume is surrounded by an outer layer of liquid scintillator non doped in gadolinium in order to enhance both the homogeneity of the energy response and the detection efficiency. This poster will present the design of the Stereo detector, the simulation performed to characterize its response, the background studies as well as the sensitivity of the experiment.

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Track Classification: Short Baseline Oscillations / Sterile Neutrinos / Non-standard Oscillations