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Status of the STEREO experiment (15' + 5')

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The re-evaluation of the theoretical anti-neutrino flux emitted by nuclear reactors revealed a deficit of about 6% between the observed flux and the expected one. This so-called reactor anti-neutrino anomaly has a statistical significance of 2.7σ, and one possible explanation to this deficit could be the existence of a light sterile neutrino state into which reactor anti-neutrino oscillate at very short distances. The STEREO project, which will be presented in this talk, aims to find an evidence of such oscillation.

The measurement will take place at only few meters (9-11m) from the compact core of the Institut Laue-Langevin research reactor in Grenoble (France), which provides a large flux of electron anti-neutrinos with an energy range from 1 to 10 MeV. The sensitive volume of the STEREO detector is $2m^3$ of organic liquid scintillator doped with Gadolinium, consisting of 6 cells stacked along the direction of the core and detecting anti-neutrinos via inverse beta decay.

This setup will provide excellent sensitivity to short-baseline oscillations effects by precisely measuring any relative distortion of the anti-neutrino spectrum as a function of both energy and baseline.

Close proximity to the reactor yield a high background environment that is managed through heavy shielding surrounding the detector. A water-cerenkov muon veto will be settled above the detector to tag incoming cosmic muons.

The detector is currently under construction and is expected to deliver first results in 2016.

Primary author: ZSOLDOS, Stephane

Presenter: ZSOLDOS, Stephane

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