



Contribution ID: 69

Type: Oral

Recent results on the search for eV sterile neutrinos with the STEREO experiment

Wednesday, 5 June 2019 15:16 (23 minutes)

In the recent years two unsolved anomalies have appeared during the study of the reactor neutrinos: one related to the neutrino spectral shape, and another to the absolute neutrino flux. The latter, known as the Reactor Antineutrino Anomaly (RAA), presents a deficit in the observed flux compared to the expected one. This anomaly could point to the existence of a light sterile neutrino participating in the oscillation phenomena, which can be tested by searching for oscillations of reactor neutrinos at very short baselines.

The STEREO experiment is aiming to find an answer to this anomaly. It observes neutrinos from the compact, highly enriched fuel element of the research reactor of the Institut Laue-Langevin (Grenoble, France). The detector is placed at only 10 meters from the reactor core, and in order to have an independent measurement of the neutrino spectrum, it is segmented in six independent cells providing a multiple baselines analysis. The recorded data during 185 days reactor-on and 233 days reactor-off are compatible with the null oscillation hypothesis and reject the original best-fit of the RAA at 99.8 C.L. The improvements performed during the second phase of data taking and preliminary results will be presented in this talk.

Collaboration name

Stereo

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Session Classification: Neutrino

Track Classification: Neutrino Physics