

STEREO search for a sterile neutrino at the ILL Grenoble reactor

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In the recent period, re-evaluations of the neutrino flux and spectrum emitted by nuclear reactors have led to the so-called Reactor Antineutrino Anomaly (RAA). This anomaly could be caused by the existence of a light sterile neutrino eigenstate participating in the neutrino oscillation phenomenon. This implies the presence of a fourth mass eigenstate, while global fits of reactor experimental data favor oscillation parameters of the order $\sin^2(2\theta)=0.1$ and $\Delta m^2=1 \text{ eV}^2$.

The STEREO experiment was built to search for eV sterile neutrinos at a short baseline of 10 meters from the compact core of the research reactor of the Institut Laue-Langevin (ILL) in Grenoble, France. The segmentation of the detector in six target cells allows for independent measurements of the neutrino spectrum at multiple baselines. STEREO takes data since end of 2016 and started to produce constraining results on an active-sterile flavor oscillation. The talk will describe the STEREO experiment principles and will detail the status of its data analysis.

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