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Latest results of the STEREO experiment

Friday, July 8, 2022 11:45 AM (15 minutes)

STEREO is a segmented, Gd-loaded liquid scintillator calorimeter that studied anti-neutrinos produced by the compact, highly ^{235}U -enriched reactor core of the Institut Laue-Langevin in Grenoble (France). The experiment ran from 2016 to 2020 and was designed to test the light sterile neutrino explanation of the Reactor Antineutrino Anomaly (RAA) by comparing the neutrino energy spectra recorded by its six detector cells, located between 9 and 11 m away from the centre of the reactor core.

In this talk we present results on the search for short baseline oscillations driven by a sterile state using STEREO's full dataset. We exclude a large fraction of the RAA favoured region in the $\Delta m_{41}^2 - \sin^2(2\theta_{ee})$ parameter space, including the RAA best-fit point. We also discuss our latest and most precise measurement of the ^{235}U reactor antineutrino energy spectrum. We confirm other experiments findings and observe at high confidence level ($> 4\sigma$) an excess around 5 MeV when comparing to a normalised Huber-Mueller prediction. Finally, we also give our latest measurement of the reactor anti-neutrino flux, among the world's most precise for a HEU reactor.

In-person participation

Yes

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