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The STEREO neutrino experiment: Overview & latest results.

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STEREO is a high-precision experiment that studies the antineutrinos produced by the highly enriched U-235 core of the nuclear reactor at the Institute Laue-Langevin (ILL) in Grenoble, France. The experiment aims to investigate two key anomalies observed in previous reactor neutrino experiments. The first anomaly, known as the "Reactor Antineutrino Anomaly (RAA)," involves a discrepancy in the measured flux of antineutrinos from reactors. STEREO has tested the sterile neutrino hypothesis as a possible explanation for this anomaly through a model-independent oscillation analysis conducted at a very short baseline of 9-11 meters, using a segmented liquid scintillator detector composed of six identical cells, and utilizing the inverse β decay (IBD) process.
STEREO has achieved an accurate calculation of the absolute antineutrino rate, with a good control of uncertainties as 1.4% of thermal power.
The second anomaly concerns the shape of the antineutrino energy spectrum, where an excess of events around 5 MeV—known as the "Bump"—was observed. Through a thorough analysis of the detector's response, STEREO has accurately characterized the antineutrino spectrum, which will serve as an important benchmark for other neutrino physics experiments.
This presentation provides an overview of the STEREO experiment, the latest results, and future research directions.

Working Group

WG 5: Neutrinos Beyond PMNS

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