

CONNIE: A low-energy experiment with reactor neutrinos

The Coherent Neutrino-Nucleus Interaction Experiment (CONNIE) uses fully depleted high-resistivity CCDs (Charge Coupled Devices) to detect the coherent elastic neutrino-nucleus scattering (CE ν NS) of reactor antineutrinos with Silicon nuclei and probe physics beyond the Standard Model. CONNIE is located at a distance of 30 m from the core of the 3.8 GW Angra-2 nuclear reactor, in Brazil. Since its 2016 upgrade, the experiment has operated with a noise level of less than 2 e RMS and an active mass of 50 g. The analysis of the 2016-2018 data allowed to set a 95% C.L. upper limit on the CE ν NS rate. This result was used to restrict simplified extensions of the SM involving light mediators imposing the best limits between experiments looking for CE ν NS for low-mass mediators. Here, we report on CONNIE's performance over the past 4 years, the finalized blind analysis of the 2019 data featuring a lower energy threshold (50 eV), and prospects for using Skipper-CCDs to observe CE ν NS in nuclear reactors.

Working group

WG6

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