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Current status of the RICOCHET experiment at ILL

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The RICOCHET collaboration is currently building a neutrino observatory to measure with high precision the coherent elastic neutrino-nucleus scattering (CEvNS) of low-energy (< 10 MeV) reactor antineutrinos at the Institut Laue-Langevin (ILL) in Grenoble, France. Two separate cryogenic calorimeter technologies are being developed by the collaboration: the CryoCube is an assembly of germanium targets with neutron-transmutation-doped thermistors for the heat readout and aluminum electrodes for the ionization readout, while the Q-Array relies on superconducting targets and transition-edge sensors. To identify nuclear recoils associated to the CEvNS and reject the electron recoil background, the CryoCube combines the readout of the heat and ionization channels. In the Q-Array, the background rejection relies on the different pulse shapes for electron and nuclear recoils.

A progressive commissioning of the detector (with the CryoCube technology only) took place at ILL. In 2024, three 40-gram germanium targets were operated during several months, both in reactor ON and reactor OFF periods, with the full external and internal shieldings installed, allowing to validate cryogenics performances and measure background levels. The atmospheric muon veto operation was also validated. During the first half of 2025, the payload was extended to nine germanium targets, and the full 18-targets assembly is planned to be installed during Summer 2025, marking the start of the science data-taking period. In this contribution, the results of the commissioning phase will be presented, as well as the updated CEvNS discovery sensitivity based on the in-situ background levels and detector performance.

Secondary track

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