

First demonstration of 30eVee ionization energy resolution with RICOCHET germanium cryogenic bolometers

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The RICOCHET reactor neutrinos observatory is planned to be installed at Laue Langevin Institute (ILL) starting in mid-2022. The scientific goal of the RICOCHET international collaboration is to perform a low-energy and percentage-precision CEvNS measurement. To that end, RICOCHET will host two cryogenic detector arrays : the CRYOCUBE (Ge target) and the Q-ARRAY (Zn target).

The CryoCube will be composed of 27 Ge crystals of 30g instrumented with NTD-Ge thermal sensor as well as aluminum electrodes operated at 10 mK in order to measure both the ionization and the heat energies arising from a particle interaction. One of the specifications the Cryocube has to follow to be a competitive CENNS detector is to attain a low energy threshold (~ 50 eV), which requires a low ionization energy resolution.

In this poster, we present the latest developments in the optimization of the measure of the ionization energy that led to a first demonstration of a 30eVee ionization energy resolution. This poster will include the presentation of the experimental setup and the analysis of the data that presents this world-leading resolution.

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