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P1.003 Lowering the CUORE energy threshold

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The Cryogenic Underground Observatory for Rare Events (CUORE) is a ton-scale double beta decay experiment based on TeO₂ cryogenic bolometers that is currently in the last construction stage at the Gran Sasso National Laboratory (LNGS).

Its primary goal is to observe neutrino-less double beta decay of ¹³⁰Te, however thanks to the ultra-low background and large projected exposure it could also be suitable to other rare event searches, as the detection of solar axions, neutrinos from type II supernovae or direct detection of dark matter. The sensitivity for these searches will depend on the performance achieved at low energy threshold. For this reason a trigger algorithm based on continuous data filtering has been developed which will allow lowering the threshold down to the few keV region.

The new trigger have been tested in CUORE-0, a single-tower CUORE prototype consisting of 52 TeO₂ bolometers and recently concluded, and here we present the results in terms of trigger efficiency, data selection and low energy calibration.