

# Low Energy Analyses with CUORE and a Search for Solar Axions

*Tuesday, 18 June 2024 17:30 (2 hours)*

The Cryogenic Underground Observatory for Rare Events (CUORE) is a bolometric neutrinoless double-beta ( $0\nu\beta\beta$ ) experiment, which has collected over 2 Tonne-years of  $\text{TeO}_2$  exposure. CUORE's primary analysis of searching for  $0\nu\beta\beta$  in  $^{130}\text{Te}$  has an energy region of interest at  $\sim 2,500$  keV. CUORE's extremely low background levels, high energy resolution, and exposure make multiple other rare event searches possible. New data analysis tools and studies enable searches in CUORE's low energy region below 100 keV, two orders of magnitude below the  $0\nu\beta\beta$  region of interest.

Searches in CUORE's low energy region, such as for low mass dark matter and solar axions, could provide new insights and complement other particle physics searches. Previous CUORE studies typically use an analysis threshold of 40 keV for searches. Lowering this threshold, along with a better understanding of low-energy events and backgrounds, improves knowledge of background and coincidence events for all searches. This contribution describes analysis methods developed for the CUORE low energy region. It will also detail a search for solar axions or Axion Like Particles (ALPs), well-motivated dark matter candidates that could provide a solution for the QCD Strong CP problem. This analysis implements these tools as a first search in this energy region with CUORE.

## Poster prize

Yes

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**Session Classification:** Poster session and reception 1

**Track Classification:** Neutrinoless Double Beta Decay