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Implementation of an Optimal Trigger in CUPID-Mo to allow for Low Energy Searches

CUPID-Mo is a demonstrator located in Modane, France for the proposed upgrade of the ton-scale 0νββ search experiment CUORE. CUPID-Mo searches for 0νββ decay in ^{100}Mo via an array of 20 enriched Li_2MoO_4 (LMO) crystals (0.2 kg) with Ge-wafer light detectors to discriminate between α and β/γ events via collection of both heat and scintillation light. Lower thresholds can allow for low energy dark matter searchers. This can be accomplished by an Optimum Trigger (OT) which constructs a matched filter using the expected signal increasing the SNR and significantly improves triggering compared to a standard derivative trigger. With thresholds improved to <10 keV and further improvements possible, searching for spin-dependent dark matter interactions with Li in LMO crystals becomes promising. Here we present the improvements in energy threshold from the OT and prospects for a low energy dark matter search.

Mini-abstract

An Optimum Trigger can lower thresholds in CUPID-Mo allowing for low energy dark matter searches

Experiment/Collaboration

CUPID-Mo

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