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Final results of the CUPID-0 combined background model

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A solid observation of neutrino-less double beta decay ($0\nu\text{DBD}$) relies on the possibility of operating high-energy resolution detectors with detailed background control. Scintillating cryogenic calorimeters are one of the most promising tools to fulfill the requirements for a next-generation experiment. CUPID-0 has been the first demonstrator of the proposed CUPID experiment based on this experimental technique. The detector, consisting of 24 enriched and 2 natural ZnSe crystals, has been taking data at Laboratori Nazionali del Gran Sasso from March 2017 to December 2018 (Phase I) and from May 2019 to February 2020 (Phase II), for a total exposure of 16.59 kg yr of ZnSe. In this contribution, we present the final results of CUPID-0 phase-I and phase-II combined background model. We identify with improved precision the background sources in the region of interest for neutrinoless double β -decay, making more solid the foundations for the background budget of the next-generation CUPID experiment. Relying on the excellent data reconstruction, we measure the two-neutrino double β -decay half-life of ^{82}Se with unprecedented accuracy.

Submitted on behalf of a Collaboration?

Yes

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