

Validation of LMO crystals for the CUPID Experiment

Wednesday 27 August 2025 14:00 (20 minutes)

CUPID (CUORE Upgrade with Particle IDentification) will search for the neutrinoless double-beta decay of Mo-100 using an array of 1596 Li_2MoO_4 (LMO) crystals enriched at 95% in ^{100}Mo operated as cryogenic calorimeters. The scintillation light produced by the LMO crystals will enable active, event-by-event particle identification, which is crucial to achieve the target background level of 10^{-4} counts/keV/kg/year at the Q-value of the transition (3034 keV). The CUPID LMO crystals must meet a series of strict requirements regarding both radiopurity and calorimetric performance (light yield and energy resolution). To assess the quality, a fraction of the produced crystals will undergo dedicated measurements at cryogenic temperatures. This program, known as the CUPID Crystal Validation Runs (CCVRs), has already begun with dedicated measurements at ~ 15 mK carried out on the pre-production batches in a low-background dilution cryostat at the Laboratori Nazionali del Gran Sasso (LNGS) in Italy, the same underground laboratory that will host CUPID. The CCVR validation program will continue throughout the production of the CUPID crystals. In this talk, I will present the CCVR protocol, outlining the detector assembly, the data analysis methodology, and the first results obtained from the preliminary batches of crystals produced during the pre-production phase.

Collaboration you are representing

CUPID

Author: GIROLA, Massimo (INFN - MIB)

Presenter: GIROLA, Massimo (INFN - MIB)

Session Classification: Underground Laboratories

Track Classification: Underground Laboratories – Technology