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Latest results and updates from the COSINUS experiment

Wednesday, August 30, 2023 2:00 PM (15 minutes)

COSINUS (Cryogenic Observatory for SIgnals seen in Next generation Underground Searches) is designed to unveil the nature of the dark matter signal claim by the DAMA/LIBRA collaboration. COSINUS develops NaI cryogenic scintillating calorimeters with transition edge sensors (TESs) to test the detection of the annually modulating signal observed by DAMA/LIBRA independently from the target material and the dark matter model. With a dual channel detector measuring both the energy converted into phonons and into scintillation light from a particle interaction in the NaI crystal, COSINUS can discriminate event-by-event the electromagnetic background from the nuclear recoils. Applying the novel remoTES design to a 1 cm^3 NaI crystal, COSINUS reached a baseline resolution of 441 eV in the phonon channel. Optimisation studies to adapt this readout design to larger mass crystals (of up to 90 g) are ongoing. The construction of COSINUS in the National Laboratory of Gran Sasso in Italy started in autumn 2021, and since then progresses persistently. The next big milestone is the commissioning of the cryogenic apparatus, foreseen to be completed by the end of 2023. The data taking with a first detector array is planned to start in early 2024; first physics results are anticipated after about one year of data taking, in 2025.

Submitted on behalf of a Collaboration?

Yes

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