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Update on the TREX-DM Experiment at LSC

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TREX-DM (TPC for Rare Event eXperiments – Dark Matter) is designed for the direct search of WIMPs in the low-mass region. For the detection of these rare interactions, ultra-low background levels and a low energy threshold are required. TREX-DM meets these conditions by operating a high-pressure TPC filled with argon- (or neon-) based gas mixtures with a large microbulk Micromegas, chosen for its intrinsic radiopurity and low energy threshold capability. The experiment is located at the Canfranc Underground Laboratory (LSC), which significantly reduces cosmic-induced events. Additionally, the detector is shielded with multiple layers to suppress ambient backgrounds—copper and lead for gamma rays, and polyethylene and water tanks for neutrons.
To further improve the low-energy threshold, a novel detection approach consisting on a GEM preamplification stage above the Micromegas is being tested. This has shown great potential for its application in the TREX-DM detector, demonstrating a threshold of O(10) eV.
This talk will present an overview of the TREX-DM experiment and the current status of the detector, including preliminary results of the GEM+Micromegas detection system, as well as the latest updates on the detectors cathode to further reducing the background.

Abstract

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