

Status of the TREX-DM experiment at the Canfranc Underground Laboratory

Monday, 24 July 2017 14:30 (15 minutes)

Looking for low-mass WIMPs (<10 GeV) which could be pervading the galactic dark halo requires the use of light elements as target and detectors with very low energy threshold. The TREX-DM (TPC Rare Event eXperiment for Dark Matter) experiment is conceived to fulfil these requirements by means of a gas time projection chamber (TPC) equipped with novel micromesh gas structures (Micromegas) readout planes. The detector can hold, in the fiducial volume, ~ 20 litres of pressurized gas up to 10 bar, which corresponds to ~ 0.300 kg of Ar at 10 bar, or alternatively 0.160 kg of Ne. The Micromegas are highly segmented and will be read with a self-triggered acquisition, allowing for effective thresholds below 0.4 keV (electron equivalent). An exhaustive material screening campaign has allowed to design and construct the detector and shielding with the state-of-the-art radiopurity specifications. The preliminary background model suggests that levels of the order of 1-10 counts $\text{keV}^{-1} \text{kg}^{-1} \text{d}^{-1}$ are expected in the region of interest, making TREX-DM competitive in the search for low mass WIMPs. The experiment has been approved by the Canfranc Underground Laboratory (Laboratorio Subterráneo de Canfranc, LSC) and after completion of a series of measurements at ground level is expected to be installed at the LSC facilities by the end of the current year. A tentative schedule foresees a data-taking campaign of approximately 3 years starting with Ne, with the option to change to (depleted) Ar. Latest experimental results, status of the commissioning, description of background model and the corresponding WIMP sensitivity will be presented.

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Session Classification: New Technologies

Track Classification: New Technologies