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(U*) CUTE Neutron Calibration System

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The Cryogenic Underground TEst facility (CUTE) is located 2 km underground at SNOLAB in Sudbury, Ontario. The response of cryogenic germanium and silicon semiconductor detectors is characterised through testing at CUTE prior to use in the Super Cryogenic Dark Matter Search (SuperCDMS) experiment. SNOLAB and CUTE together provide a low background environment for testing, shielded from cosmic rays and other interfering radioactive backgrounds. CUTE currently has two sources available within the facility for gamma calibration, used to characterise the high voltage detector response. iZIP detectors being tested in the coming years will need a neutron calibration source available to characterise their response.

Transportation of radioactive sources within SNOLAB is a process requiring advance planning in order to notify other experiments about the possible presence of unaccounted for radioactive sources. Due to the ever-changing nature of any experimental work this process can cause further delays when testing cannot be done promptly as needed. The CUTE neutron calibration system is built to solve this issue. The system uses a californium 252 source which is pulled by a motor through a tube located within the shield water tank, allowing the location of the neutron source to be controlled remotely. Testing for the system has begun with implementation foreseen in September 2023. This talk will discuss the commissioning and applications of the neutron calibration system at CUTE.

Keyword-1

Dark Matter

Keyword-2

Calibration

Keyword-3

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