

SuperCDMS Background Explorer Functionality and Validation

Friday, 17 February 2023 19:30 (15 minutes)

The SuperCDMS SNOLAB experiment is a next-generation direct detection dark matter search experiment with an anticipated world-leading sensitivity to particles with masses $\leq 10 \text{ GeV}/c^2$. The experiment is currently under construction at SNOLAB in Sudbury, Ontario. The unique facility, located 2 km underground, offers abundant shielding against cosmic rays. The SuperCDMS experiment requires a low background environment. All materials surrounding the experiment are assayed as they could contain impurities that can decay radioactively and cause an interaction within the detectors. As a result, various isotopes in these enveloping materials will have their expected background simulated and estimated. Furthermore, contributions from neutrinos and cosmic rays whose spectra are calculated analytically can be taken into account. Background Explorer is a python/web toolkit used for book-keeping background estimations for the SuperCDMS experiment as well as other experiments, including the Cryogenic Underground TEst facility (CUTE) at SNOLAB and the Deep Underground Neutrino Experiment (DUNE). Background Explorer takes an input of components, simulation datasets, and assay data to construct background spectra and display results in a user-friendly web interface. This presentation will demonstrate the functionality of Background Explorer V2 and its validation against the previously estimated backgrounds for SuperCDMS.

Supervisor

Dr. Miriam Diamond and Dr. Ziqing Hong

Funding Agency

University of Toronto

Supervisor Email

mdiamond@physics.utoronto.ca and zqhong@physics.utoronto.ca

Your Email

tj.martin@mail.utoronto.ca

Primary author: MARTIN, Tyler (University of Toronto)

Presenter: MARTIN, Tyler (University of Toronto)

Session Classification: February 17 Evening Session

Track Classification: Dark Matter Searches