

This project investigates the characteristics of a muon beam produced in electron-fixed target collisions to study dark sector physics with an experimental concept similar to the Light Dark Matter eXperiment (LDMX). Using the Geant4 simulation framework, we model interactions between an 8 GeV electron beam and a tungsten target to evaluate muon yield and background processes under varying target geometries. Additionally, we performed spatial and angular analysis of muon emission and background particle fluxes to inform filtering strategies. We also performed numerical calculations based on the characterization of the muon flux to understand the sensitivity of the experiment to various scenarios of new physics.