

Abstract Submitted  
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**Monte Carlo Simulation of Cosmogenic Processes for the SURF Experiments**<sup>1</sup> CHAO ZHANG, DONGMING MEI, University of South Dakota — Sanford Underground Research Facility (SURF) at Homestake Mine will host several experiments in searching for dark matter, neutrinoless double-beta decay, and neutrino oscillation with a long baseline neutrino beam. The muon-induced cosmogenic processes are background matter to the planned experiments and those cosmogenic processes will directly impact the design of the experimental shielding to achieve the target sensitivity. Therefore understanding the muon-induced processes is important. We conduct a full Monte Carlo simulation to characterize the muon-induced background level for SURF. Detailed mountain profile and averaged rock composition are considered for muon attenuation from the surface to the 4850-ft level. We report the simulation results for the muon-induced neutron flux, energy spectrum, and angular distribution at the 4850-ft level.

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