



Contribution ID: 83

Type: **Oral Presentation**

External Radiological Backgrounds for the DUNE Experiment at Sanford Lab

Friday, June 17, 2022 3:30 PM (15 minutes)

The far detector of the Deep Underground Neutrino Experiment (DUNE) will be located 1500m underground at the Ross campus of the Sanford Underground Research Facility (SURF). The excavation of the two detector halls, that will house together four 17.5kt scale DUNE modules, has commenced. External radiological neutron and gamma-ray backgrounds from the rock, shotcrete and concrete have been evaluated based on a variety of radioactivity assays, as well as chemical composition assays, crucial for the production and propagation of neutron backgrounds. The results from both the extensive radioactivity assays and the extensive chemical composition assays have been utilized as informed input for Geant4 based simulations of the resulting external radiological neutron and gamma-ray backgrounds at the Ross underground campus for the DUNE experiment.

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Session Classification: LRT 2022 - presentations

Track Classification: Experiment Backgrounds, Models, Simulations