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Radiological Backgrounds in DUNE Far Detectors

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The Deep Underground Neutron Experiment (DUNE) uses a neutrino beam and near detectors at Fermilab and four 10 kilotonne liquid argon Far Detector modules at SURF in South Dakota in order to measure fundamental neutrino properties and to search for supernova neutrinos, nucleon decay, and a plethora of other physics topics. While DUNE's far detectors are powerful tools for studying a wide variety of signals, radiological backgrounds may degrade resolution and event reconstruction, thereby posing an obstacle to DUNE realizing its widest possible potential, they may impair detection and reconstruction of hadronic interactions, and they may impede sensitivity to low-energy signals such as supernova and solar neutrinos. Radiological backgrounds arise from the natural contamination of radioactive isotopes in detector materials and the surrounding cavern, as well as from cosmogenic sources still present underground. This talk will provide an overview of radiological backgrounds relevant for DUNE's far detectors, discuss challenges associated with them, and review techniques for modeling and mitigating them.

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