

Background from Cosmogenic Activation in the DM-Ice Dark Matter Experiment

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DM-Ice is a quarter-ton-scale dark matter experiment planned for deployment deep in the ice at the South Pole. This experiment will search for the expected annual modulation signature in the dark matter signal using low-background NaI(Tl) scintillating crystals. Cosmogenic activation of the detectors during transport to and storage at the South Pole (altitude 9,301 feet) has the potential to produce long-lived radioisotopes which will add a significant source of background and threaten the discovery potential of this experiment. In data from the presently operating DM-Ice17 detectors, we examine decaying regions of the spectrum to identify activated isotopes and estimate activation effects. We compare these activation estimates to our simulation for the DM-Ice17 detectors and discuss the effects on the full-scale DM-Ice experiment.

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