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Cosmogenic Fast Neutron Backgrounds in the PROSPECT Reactor Antineutrino Detector CHRISTIAN NAVE, Drexel Univ, PROSPECT COLLABORATION — The Reactor Antineutrino Anomaly (RAA) is an observed deficit in flux of antineutrinos emitted from nuclear reactors as compared to prediction. One proposal to explain this phenomenon is via the existence of sterile neutrinos: a flavor of neutrino to which other neutrinos can oscillate that does not interact via the weak force. PROSPECT, the Precision Reactor Oscillation and Spectrum Experiment, is designed to explore this theory through short-baseline detection of electron antineutrinos emitted from the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory. PROSPECT detects neutrinos through inverse beta decay (IBD) reactions on protons, which result in distinctive coincidences between prompt positron events and delayed neutron capture events. Having a neutrino detector on the surface of the earth at a distance 7-11 meters from a nuclear reactor requires careful treatment of various background signals. This presentation will discuss background classes generated by incident cosmogenic fast neutrons with a focus on those that mimic both the prompt and delayed IBD signals and include comparison to simulation results that use reference cosmogenic fluxes. In addition, the time-dependencies of neutron and IBD backgrounds within the detector will be described.

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