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Implementation of an Upward-Going Muon Trigger for Indirect Dark Matter Searches with the NOvA Far Detector

The NOvA collaboration has constructed a 14,000 ton, fine-grained, low-Z, total absorption tracking calorimeter at an off-axis angle to an upgraded NuMI neutrino beam. This detector, with its excellent granularity and energy resolution, and relatively low-energy neutrino thresholds was designed to observe electron neutrino appearance in a muon neutrino beam but it also has unique capabilities suitable for more exotic efforts. In fact, if an efficient upward-going muon trigger with sufficient cosmic ray background rejection can be demonstrated, NOvA will be capable of a competitive indirect dark matter search for low-mass WIMPs. The cosmic ray muon rate at the NOvA far detector is about 100 kHz and provides the primary challenge for triggering and optimizing such a search analysis. The status of the NOvA upward-going muon trigger and initial sensitivity estimates for indirect detection of WIMP dark matter will be presented.

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