

Abstract Submitted  
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**Finding Sterile Neutrinos from Nuclear Reactors** JARED HAUGHTON, Drexel University, PROSPECT COLLABORATION — A neutrino is a subatomic particle with no electrical charge that only interacts with other particles through the weak force and gravitational force. Neutrinos are produced in nuclear reactions, such as those in nuclear reactors and the sun. Furthermore, neutrinos come in three distinct “flavors” – electron, muon, and tau neutrinos. Neutrinos have been found to oscillate between their different flavor states. Due to differences in the expected number of neutrinos from nuclear reactions and the actual observed count, there is speculation that there is at least one more flavor of neutrino that has not been observed yet. This “sterile” neutrino would not interact via the weak force, and thus would be functionally invisible. This project, PROSPECT, is focused around searching for these sterile neutrinos, using a nuclear reactor as a source. I have calibrated a prototype of a segmented plastic scintillator, which will use light to distinguish between neutrino interactions and other types of interactions in the prototype. The final detector may use this technology to provide evidence of some undetectable “sterile” neutrino.

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