Abstract Submitted
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Analysis of Nuclear Reactor Background Radiation for Neutrino Experiments[1] RICKY LEBLANC, J.C. BLACKMON, B.C. RASCO, Louisiana State University, H.P. MUMM, National Institute of Standards and Technology, MTC AND NULAT COLLABORATION — Prior measurements of reactor antineutrinos have found a lower flux than expected. Precision measurements of antineutrino energy spectra are important for understanding the anomaly, reactor safeguards, and nuclear nonproliferation. Antineutrino detector designs rely on good characterization of gamma-ray and neutron backgrounds near the reactor core. To study the gamma-ray background at the NIST research reactor, spectra were collected using a 6.25 cm diameter x 5.5 cm germanium detector. We analyzed the measured spectra using simulations of the detector response using the GEANT4 toolkit to determine background fluxes and build a background model that will be used to understand shielding requirements and the impact of backgrounds on potential short-baseline reactor antineutrino studies at NIST.

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