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Gamma-Neutron Waveform Discrimination for the KOTO Experiment NOAH MCNEAL, Univ of Michigan - Ann Arbor, KOTO COLLABORATION — The KOTO experiment is a high-energy particle physics experiment located at the J-PARC research facility in Tokai, Japan. The goal of the experiment is to measure the branching ratio (BR) for the neutral kaon decaying into a neutral pion and two neutrinos. This decay is rare and takes place via a directly CP-violating process. The BR predicted by the Standard Model is less than 1 per 30 billion. Due to the rarity of this decay, it has yet to be observed; however, an experimental BR measurement will either confirm Standard Model predictions or indicate new physics. The neutral particle beam is created from protons on a gold target. Neutrons are produced with neutral kaons. A fraction of these interact with the Cesium Iodide (CsI) detector and produce a signal similar to the signature 2-photon signal of our target decay. As a countermeasure, we will install hardware to allow both upstream and downstream signal readouts of the CsI. The timing difference of the measurements allowsus distinguish neutronsand photons. To prepare for this upgrade, we have performed a "tail-to-total" method of waveform differentiation to achieve thegamma-neutron discrimination. This poster will present the analysis of the method and results on an optimal method to suppress the neutron background.

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