

Abstract Submitted
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Analyzing KOTO Data With Correlation Coefficients¹ DUNCAN MCFARLAND, JOSEPH COMFORT, Arizona State University — The KOTO experiment is underway at the JPARC laboratory to measure the branching ratio for the $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$ decay. The ratio provides a direct measure of Standard Model parameter that is responsible for CP violation, and the SM prediction of 2.4×10^{-11} has small uncertainties. Two-photon events will be detected in a large array of 2716 CsI crystals, surrounded by veto detectors to suppress backgrounds. The raw signals are filtered to produce Gaussian-shaped peaks and digitized to provide both energy and time information. Sensitivity to very small signals is needed. We have developed a method that leverages the nearly constant peak shape to distinguish real signals from noise with high reliability.² Its use and performance will be applied to the analysis of early data from a 2013 run.

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²D. Bylth, M. Gibson, D. Mcfarland, and J.R. Comfort, Nucl. Instrum. Methods A **738**, 206 (2014).

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