

Search for the rare decay of $K_L \rightarrow \pi^0 \nu \bar{\nu}$ at J-PARC

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The KOTO experiment is dedicated to observing the rare decay $K_L \rightarrow \pi^0 \nu \bar{\nu}$ at the J-PARC 30 GeV proton synchrotron. This decay breaks the CP symmetry directly and is highly suppressed in the Standard Model. Thus this decay mode is sensitive to new physics beyond the SM, in particular the physics related to CP violation.

Data collected in 2013 were analyzed and published in 2017. Several new backgrounds were found in the 2013 analysis, and improvements to the detector were made suppress these backgrounds. Data collection resumed in 2015, increasing the amount of data by a factor of 20, which corresponds to a branching ratio sensitivity of $O(10^{-9})$.

In this contribution, we will present analysis results of 2015 data.

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