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Search for the $K_L \rightarrow \pi^0 \gamma$ decay in the KOTO experiment

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$K_L \rightarrow \pi^0 \gamma$ is forbidden by the standard model because this decay mode threatens the Lorentz invariance and gauge principle. There have been various experimental tests of the Lorentz invariance using optical cavities, however, experimental tests in the high energy regime are also useful probes of New Physics.

In spite of its interesting opportunity, neither $K_L \rightarrow \pi^0 \gamma$ nor $K_S \rightarrow \pi^0 \gamma$ have not been measured experimentally.

We searched for the $K_L \rightarrow \pi^0 \gamma$ decay using data recorded from 2016 to 2018 at the J-PARC proton beam facility.

The expected signal sensitivity is approximately 10^{-7} .

We are planning to open the signal box, and will report on the estimation of the level of backgrounds together with the preliminary result of the branching fraction for the $K_L \rightarrow \pi^0 \gamma$ decay.

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Session Classification: Rare and forbidden Kaon decays - 2