

BEACH 2024: XV International Conference on Beauty, Charm, Hyperons in
Hadronic Interactions

Contribution ID: 29

Type: **not specified**

KOTO: Search for $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$

Thursday, 6 June 2024 11:30 (30 minutes)

KOTO is the dedicated experiment to study the CP-violating decay $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$. This decay is sensitive to New Physics because its branching ratio is predicted to be 3×10^{-11} with only 2% theoretical uncertainty. By using the data collected in 2021, we have set the worldwide best limit on the branching ratio of this decay to be 2.0×10^{-9} at the 90% confidence level. KOTO is expected to collect ten times more data within the following 4 years and explore the New-Physics-sensitive regime. We are also preparing for the next-generation experiment, KOTO-II, to accurately examine the Standard Model. The analysis status and future plan will be summarized in this talk.

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Session Classification: Session 6