Contribution ID: **1176** Type: **Parallel session talk**

The search for $K_L^0 \to \gamma + dark\ photon(\bar{\gamma})$ at the KOTO experiment.

Thursday 18 July 2024 11:19 (17 minutes)

We present the study of the massless dark photon ($\bar{\gamma}$) in the $K_L^0 \to \gamma\bar{\gamma}$ decay at the J-PARC KOTO experiment. Distinguished from the massive dark photon, the massless one does not directly mix with the ordinary photon but could interact with Standard Model (SM) particles through direct coupling to quarks. Some theoretical models propose that the branching ratio ($\mathcal{BR}$) of the $K_L^0 \to \gamma\bar{\gamma}$ decay could reach up to $\mathcal{O}(10^{-3})$, which is well within the KOTO's sensitivity for this study. Although the challenge is posed by the lack of kinematic constraints, the KOTO hermetic veto system provides a unique opportunity to probe for such decay. In this presentation, we will present the open-box result of the $K_L^0 \to \gamma\bar{\gamma}$ search based on the data collected in 2020.

I read the instructions above

Yes

Alternate track

1. Quark and Lepton Flavour Physics

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