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Search for Rare Neutral Kaon Decays at JPARC KOTO Experiment

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We present the status of JPARC KOTO experiment to search for very rare K_L decays to $\pi^0\nu\overline{\nu}$ - an FCNC and direct CP violating decay mode. KOTO has collected K_L data yearly with 30 GeV high intensity proton beam on target at JPARC since 2015 until now with increasing beam power over this period up to 64.5 kW. The results from 2016-18 data published in 2021 ($BR < 4.9 \times 10^{-9}$) revealed three candidate events in the signal region with 1.22 ± 0.26 estimated background events, dominated by the contamination of upstream charged kaon decays which was verified in 2020 run after installing upstream charged beam veto. More data has been accumulated since then. The status of blind analysis and background reductions will be reviewed in this talk with future beam power projections at JPARC and KOTO-DAQ upgrades. Plans for KOTO-II upgrades beyond the Standard Model sensitivity (3×10^{-10}) will also be presented.

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