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Data-Acquisition System Upgrade at the KOTO Experiment

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KOTO is a dedicated experiment to search for the New Physics through the ultra-rare decay $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$. In 2023, the K_L^0 beam intensity will be increased to collect K_L^0 decays faster. An upgrade of the data-acquisition system is hence introduced, including the expansion of the data throughput and the third-level trigger decision at the PC farm. The University of Chicago designed an electronic module with numerous high-speed optical links to transfer data from analog-to-digital converters, perform the event-building, and deliver complete events to the PC farm for the sophisticated level-3 trigger evaluation. The upgraded system can be simply expanded for more channel inputs and larger data throughput if needed in the future. The entire architecture and its performance will be presented.

In-person participation

Yes

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