

Concept of KamLAND2 DAQ system

Tuesday, May 25, 2021 7:30 AM (18 minutes)

KamLAND is a 1 kton liquid scintillator detector implementing 1879 of PMTs and the experiment have been exploring various neutrino physics. Based on the requirements from observations, we are designing a new DAQ system for KamLAND2, the next phase of KamLAND, to overcome the limitations on high event rate and successive data acquisition. For example, the impact of spallation backgrounds are critical in neutrinoless double-beta decay search, while we would get strong discrimination power if we could detect all of neutrons induced by spallation. For nearby supernova observation, expected event rate is about 1MHz for 1 s, that data rate corresponds to 25 Gbps. To realize fast processing, RFSoc and large DDR4 memory will be installed in the front-end electronics, 10GB Ethernet and ZeroMQ for the network. The primary trigger circuit will be replaced by a computer so that the level 2 software trigger could be issued more effectively. The overview of KamLAND2 DAQ system will be reported.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

Funding information

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Session Classification: Readout: Trigger and DAQ

Track Classification: Readout and Data Processing: Readout: Trigger and DAQ