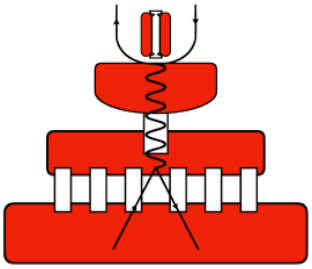

Contribution ID: **32** Type: **Poster**

Neutron rejection performance of the upgraded KOTO CsI calorimeter

Tuesday, 10 September 2019 17:44 (1 minute)

We are searching for the $K_L \to \pi^0\nu\bar{\nu}$ decay at the J-PARC KOTO experiment. This decay mode is highly suppressed in the Standard Model and its branching ratio is predicted to be $(3.0 \pm 0.3) \times 10^{-11}$ with small theoretical uncertainties. This decay mode is thus sensitive to new physics beyond the Standard Model.
The signature of the signal events is two photons from a π^0 decay and no other detected particles.One of the main background sources is caused by the beam halo neutron producing a hadronic shower in the CsI calorimeter and new neutron from this shower interacting at another position of the CsI calorimeter.To suppress this neutron backgrounds, we installed MPPCs (silicon photo sensor) on the upstream surface of CsI calorimeter in 2018.Neutrons and photons can be distinguished by using timing difference of the MPPC signal from upstream and the PMT signal from downstream. I will present the performance of the neutron background reduction with the upgraded CsI calorimeter.

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Session Classification: Poster session