博士論文公聴会の公示(物理学専攻)

学位申請者:杉山 泰之

論文題目 : Pulse shape discrimination method to suppress neutron-induced background in the J-PARC KOTO experiment

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場所: 理学研究科H棟7階セミナー室(H701号室)

主查 : 山中卓 副查 : 岸本忠史、中野貴志、青木正治、南條創

論文要旨:

The purpose of the KOTO experiment is to search for new physics that brakes the CP symmetry beyond the Standard Model of the elementary particle physics, by discovering the KL $\rightarrow \pi 0 \nu \nu$ decay and measuring its branching ratio.

I have developed the data acquisition system for the KOTO experiment, and integrated veto detectors into the system.

To suppress the background caused by neutrons hitting the CsI calorimeter, I have de- veloped a new method to reject neutron-induced clusters based on the pulse shapes of the CsI calorimeter. The method can reject 92% of background events with two neutron-induced clusters while keeping 90% of the signal acceptance.

Combined with other methods, the background caused by neutrons is supressed to the level below the branching ratio of KL $\rightarrow \pi 0 \nu \nu$ predicted by the Standard Model