Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

CANDLES – Search for Neutrino-less Double Beta Decay of ^{48}Ca
SAORI UMEHARA, Research Center for Nuclear Physics, Osaka University, CANDLES COLLABORATION — CANDLES is the project to search for neutrino-less double beta decay ($0\nu\beta\beta$) of ^{48}Ca. The CANDLES system aims at a high sensitive measurement by a characteristic detector system and ^{48}Ca enrichment. The system realizes a complete 4π active shield by immersing the CaF_2 scintillators in liquid scintillator. The active shield by the liquid scintillator will effectively reject background events from external origins. On the other band, we have studied ^{48}Ca enrichment and succeeded in obtaining enriched ^{48}Ca although it is a small amount. Now we have developed the CANDLES III system, which contained 350 g of ^{48}Ca without enrichment, at the Kamioka underground laboratory. Two improvements, a light-concentration system and a new DAQ system, were installed for the CANDLES III system. The light-concentration system improved a energy resolution by increasing a PMT photo-coverage by 80%. The new DAQ system, which is a dead time less system, improved a rejection efficiency for a characteristic background origin. We checked detector performance with the light-concentration system and the new DAQ system. Here we will report the detector performance for background rejection and the expected sensitivity with the two improvements.

Saori Umehara
Research Center for Nuclear Physics, Osaka University

Date submitted: 30 Jun 2014 Electronic form version 1.4