

First result of the CANDLES III experiment searching for double beta decay of ^{48}Ca

The observation of neutrino-less double beta decay (0nbb) would be the most practical way to prove the Majorana nature of the neutrino and lepton number violation. CANDLES studies ^{48}Ca double beta decay using CaF_2 scintillator. The main advantage of ^{48}Ca is the highest Q-value (4.3 MeV) among all the isotope candidates.

The CANDLES III detector is currently operating with 300kg CaF_2 in the Kamioka observatory, Japan. The detector consists of 96 pure CaF_2 crystals immersed in liquid scintillator as an active shield. In 2015, we constructed the additional shielding made of 7 - 12 cm thick Pb blocks and 5 mm thick B included silicon rubber sheet in order to reduce the background originating from (n,gamma) reaction. As a result, (n,gamma) background has been reduced by two orders of magnitude.

We have conducted a 0nbb search using the data collected from July to December in 2016 after shielding. In this presentation, we report our latest 0nbb search result.

Authorship annotation

for the CANDLES collaboration

Session and Location

Monday Session, Poster Wall #57 (Auditorium Gallery Right)

Poster included in proceedings:

yes

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Track Classification: Poster (not participating in poster prize competition)