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Background Studies of CANDLES for Double Beta Decays of ^{48}Ca[1] HIDEKAZU KAKUBATA, School of Science, Osaka Univ., CANDLES COLLABORATION — An underground observatory is the most effective to perform low background experiments because an underground environment avoids cosmic muon. Backgrounds still remain in this environment, so to grasp their origin and intensity is necessary. We perform the CANDLES experiment in the Kamioka Underground Laboratory to search for $0\nu\beta\beta$ of ^{48}Ca, which has the highest Q-value (4.27MeV) of all $\beta\beta$ nuclides. Here we must consider backgrounds in the energy region around the Q-value. On the CANDLES detector, internal backgrounds from radial contamination in CaF_2 crystal scintillators can be restrained to a level free from problems. However, other backgrounds were observed in the energy region higher than the Q-value and peak structure is found in 7$\sim$8MeV. We inferred that γ-rays emitted by neutron capture reactions on Fe is the main origin of backgrounds. To confirm this hypothesis, we carried out special run using ^{252}Cf neutron source set outside the detector. As a result, we found that the source of these backgrounds is γ-ray from neutron capture on the surrounding material of the detector, especially on the rock and the stainless. For further background reduction, we plan to install additional passive neutron and γ-ray shields.

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