

Astrophysical neutrino search in KamLAND

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Neutrino has been regarded as an unique tool to reveal the interiors of astronomical objects. KamLAND, which is a 1 kt liquid scintillator located in the Kamioka mine, detects electron-anti neutrinos through the inverse beta decay. Due to its significant sensitivity around a few MeV energy region, supernova neutrino ($\text{SN}\nu$) search has been conducted. Neutrinos emitted a few hours before a supernova (pre- $\text{SN}\nu$) are also detectable. We have developed the combined alert system for pre- $\text{SN}\nu$ s with the Super-Kamiokande group. In addition, we are developing a new background reduction scheme using a neural network to reduce atmospheric neutrino backgrounds for the supernova relic neutrino search. Other than $\text{SN}\nu$, KamLAND has a sensitivity to neutrinos from primordial black holes, which are one of the candidates of dark matter. In this presentation, we show the search progress of neutrinos from supernova and primordial black holes.

Alternate track

1. Astro-particle Physics and Cosmology

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Primary author: Mr EIZUKA, Minori (RCNS, Tohoku Univ.)

Presenter: Mr EIZUKA, Minori (RCNS, Tohoku Univ.)

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