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Low Energy Neutrino Studies and Backgrounds at Hyper-Kamiokande

Hyper-Kamiokande (Hyper-K) is a next generation underground water Cherenkov detector.

The baseline design is based on Super-Kamiokande (Super-K) detector and contains enlarged fiducial volume of 0.56 Mt, which is 25 times of Super-K.

Hyper-K will play a considerable role in the next neutrino physics frontier.

Here, the physics potential of Hyper-K in the neutrino astrophysics is studied.

The photo-coverage of Hyper-K will be 20%, a half of Super-K, and the cosmic background will be somewhat increased because of the location.

These conditions must be considered.

First, we investigated the cosmic muon flux and spallation background at Hyper-K candidate sites, which is a dominant background at the low energy analysis.

Then, the effect on the analysis is evaluated, applying the recent background reduction technique.

As the result, the Hyper-K's possibility for solar neutrino, supernova neutrino and supernova relic neutrino are obtained.

We will discuss about these results.

The Hyper-K's possibility with gadolinium doping will be also discussed.

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