

## Search for supernova relic neutrinos at Super-Kamiokande

The diffuse supernova relic neutrino signal is of great interest due to its correlation to cosmological parameters such as star formation rates. This signal has never been seen. Currently inverse beta decay of anti-neutrinos in the Super-Kamiokande (SK) detector provides the world's best upper flux limit of  $1.2 \nu_{\bar{e}}$  events  $\text{cm}^2 \text{s}^{-1}$ ,  $E_{\nu_{\bar{e}}} > 19.3$  MeV, which is very close to many theoretical predictions. A new method of tagging radioactive backgrounds from cosmic ray muon spallation, improved event reconstruction and selection, as well as addition of new data and a new signal extraction method allows us to lower the energy threshold and improve the sensitivity of the analysis. These new methods as well as results using SK-I, SK-II, and SK-III data are presented.

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