

## Astrophysical neutrinos at Super-Kamiokande

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Super-Kamiokande (SK) has been observing astrophysical neutrino interaction, such as solar neutrinos, for more than 20 years. SK has great sensitivity to measure supernova neutrino interactions. Currently, the 4th phase of the experiment (SK-IV) is running with an analysis energy threshold of 3.5 MeV electron kinetic energy. The accumulated live time for solar neutrino observation of all phases is more than 5200 days. We are planning to enhance the detector performance further by adding 0.2 % gadolinium sulfate ( $\text{Gd}_2(\text{SO}_4)_3$ ). The main astrophysical physics topic of this new detector phase (called SK-Gd) is the discovery of supernova relic neutrinos (SRN).

In this presentation, the current status of the solar neutrino analysis including solar neutrino oscillation results are reported. The current status of SRN analysis in SK and expectations of SRN observation at SK-Gd will also be shown.

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