

Status of the Supernova Relic Neutrino Search and Atmospheric Neutrino Neutral-Current Quasi-Elastic Interactions Measurement in Super-Kamiokande

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Supernova relic neutrinos (SRN), also called the diffused supernova neutrino backgrounds (DSNB), are emitted from core-collapse supernovae throughout the universe. Super-Kamiokande-IV tags inverse beta interactions by neutrons captured on hydrogen using improved electronics and triggering. Recently, the use of vertex reconstruction of the 2.2 MeV photons emitted by the neutron captures and a neural network improved the discrimination against backgrounds and significantly increased the efficiency. Neutral current quasi-elastic (NCQE) scattering of atmospheric neutrinos on ^{16}O in water-Cherenkov detectors forms an important remaining background in SRN detection. Using neutron tagging technique, the Super-Kamiokande measurement of the NCQE cross section of atmospheric neutrinos will be presented and compared against theoretical predictions.

Primary author: Ms WAN, Linyan (Tsinghua University)

Presenters: Ms WAN, Linyan (Tsinghua University); WAN, Linyan (Tsinghua University)

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