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The diffuse supernova neutrino background in Super-Kamiokande

Neutrinos have played a key role in astrophysics, from the characterization of nuclear fusion processes in the Sun to the observation of supernova SN1987A and multiple extragalactic events. The Super-Kamiokande experiment has played a major part in these astrophysical studies by investigating low energy $O(10)\text{MeV}$ neutrinos and currently exhibits the best sensitivity to the diffuse neutrino background from distant supernovae. Discovering and characterizing this signal however presents significant challenges due to important backgrounds from cosmic muon spallation and atmospheric neutrinos. Reducing these backgrounds will require implementing state-of-the-art neutron tagging algorithms to discriminate between different types of interactions, as well as a thorough characterization of spallation-inducing mechanisms. In this poster, I present the latest results from phase IV of Super-Kamiokande and discuss how the current strategies will evolve after the SuperK-Gd upgrade.

Mini-abstract

I will present the results of supernova relic neutrino searches in Super-Kamiokande IV.

Experiment/Collaboration

Super-Kamiokande

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