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Diffuse Supernova Neutrino Background: Insights from Super-Kamiokande & Prospects with Hyper-Kamiokande

Tuesday, 18 June 2024 17:30 (2 hours)

The Diffuse Supernova Neutrino Background (DSNB) is a theoretical astrophysical prediction of a collection of neutrinos from all core-collapse supernovae that ever existed in the Universe. It is yet to be observed. This presentation will showcase the latest results from the gadolinium-loaded Super-Kamiokande (SK) experiment and how it excludes certain theoretical models. While SK is primarily sensitive to the integrated value of the DSNB flux, the future Hyper-Kamiokande (HK) experiment will probe the shape of the spectrum in more detail. A study of HK sensitivity to relevant parameters, such as the fraction of black hole forming supernovae, will then be presented. Finally, the discussion will delve into how the observation of a nearby supernova could better constrain the DSNB models by measuring the supernova neutrino emission spectrum.

Poster prize

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