Contribution ID: **52** Type: **Oral**

Limits on the spectral parameters of core-collapse neutrinos extracted from the Diffuse Supernovae Neutrino Flux (DSNvF).

Thursday, 27 February 2020 13:30 (20 minutes)

In February 1987 neutrinos from the SN1987 traveled a distance of about 50 kpc from the Large Magellanic Cloud and were detected on Earth by two of the largest neutrino telescopes of that time, Kamiokande-II and IMB, thus confirming the vast amount of energy (~10^53 ergs) predicted to be emitted in neutrinos and setting allowed intervals for the emission parameters like the neutrinosphere temperature. The confirmation of the main features of neutrino emission for a single supernova also supports the prediction that all the past supernovae in the universe should originate a ubiquitous and isotropic neutrino flux, the so-called Diffuse Supernova Neutrino Flux (DSNvF). Up to now, no evidence of events from DSNvF was found by different neutrino telescopes. In this work, we use the upper limit on the DSNvF obtained from the null results of the Super-Kamiokande collaboration to estimate limits on average energy, spectral pinching, and neutrinosphere temperature for electron antineutrinos from a core-collapse neutrino burst. Finally, we check our results with those obtained from the solely SN1987a data concluding that the DSNvF may lead to comparable - or even better - upper limits on the neutrino emission parameters.

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Session Classification: Contributed Talks