

# Magnetorotational supernova neutrino emission spectra and prospects for observations by large-size underwater telescopes

*Tuesday, 27 June 2023 15:00 (15 minutes)*

We analyze neutrino fluxes near the surface of a protoneutron star in type II supernova explosions at core-collapse regime. For dynamoactive supernovae it is shown that effective neutrino collisions in a magnetized nucleon gas caused by the neutral current Gamow-Teller component lead to neutrino acceleration. Such an effect originates from spin-projection asymmetry in phase space volume of outer channel neutrino due to nucleon magnetic moment interaction with a field. Respective increase in a hardness of the energy spectrum is favorable for observations of supernova neutrinos using neutrino telescopes. The possibilities of detecting supernova neutrinos by large-volume Cherenkov observatories: KM3NeT and Baikal-GVD, are discussed. As is demonstrated the upper limits of the distance thresholds for such observations can be increased by a factor of  $1.5 \sqrt{k}$  when employing the  $k$ -fold coincidence technique in data processing.

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**Session Classification:** Cosmic rays of very high energies (> 1 PeV)

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