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Supernova Neutrino Search and Underground Physics at LVD

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The Large Volume Detector located in the Gran Sasso Laboratory, Italy, has been operating in the stellar core collapse neutrino search program since 1992. Based on 32 years of detector data, an experimental constraint on the frequency of neutrino bursts from gravitational collapses of stars in the Galaxy has been obtained: less than 1 event in 13.9 years at a 90% confidence level. At an average depth of 3650 m w.e., the detector registers atmospheric muons with an average energy of 280 GeV in the angular range of 0 – 90. The detector background in the low-energy range from 0.5 to 3 MeV is the natural radioactivity of the soil, the iron structures of the detector, and radon decay products in the room air. Variations in gamma quanta and muons are continuously monitored as the detector background when searching for neutrinos from supernovae. The paper presents the latest results of the analysis of the experimental data from the LVD detector.

Primary author(s) : Dr. AGAFONOVA, Natalia (INR RAS); Mr. ASHIKHMIN, Vsevolod (INR RAS)

Presenter(s) : Mr. ASHIKHMIN, Vsevolod (INR RAS)

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