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Update of the supernova neutrinos monitoring with the LVD experiment

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The Large Volume Detector (LVD) at the INFN Gran Sasso National Laboratory, Italy, is a neutrino observatory designed to study low energy neutrinos from gravitational stellar collapses. The detector, 1000 tons of liquid scintillator, is sensitive to core-collapse supernovae via neutrino burst detection with 100\% efficiency in the Milky Way.

In this paper we discuss methods of the neutrino burst search and we present the results of the last run, lasting from 2014, January 1^{st} to 2021, Jan 4^{th} for a total live time of 2504 days.

In the lack of a positive observation in this dataset and including all previously published results since 1992 for a total lifetime of 9839 days, the upper limit on the rate of core collapse and failed supernova explosions out to distances of 25 kpc is 0.085 year^{-1} at 90\% c.l. .

Keywords

Supernova; Neutrinos; Detector

Collaboration

other (fill field below)

other Collaboration

LVD Collaboration

Subcategory

Experimental Results

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