

SEARCH FOR SUPERNOVA NEUTRINOS WITH THE LVD EXPERIMENT

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on behalf of the LVD Collaboration

NNN18, Oct. 31st - Nov. 3rd @ UBC Downtown, Robson Square, Vancouver BC Canada

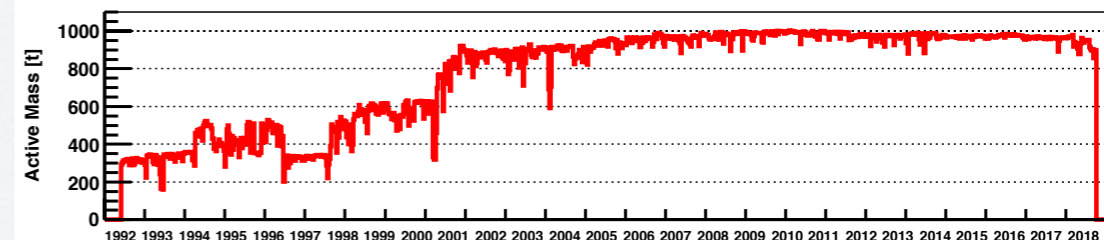
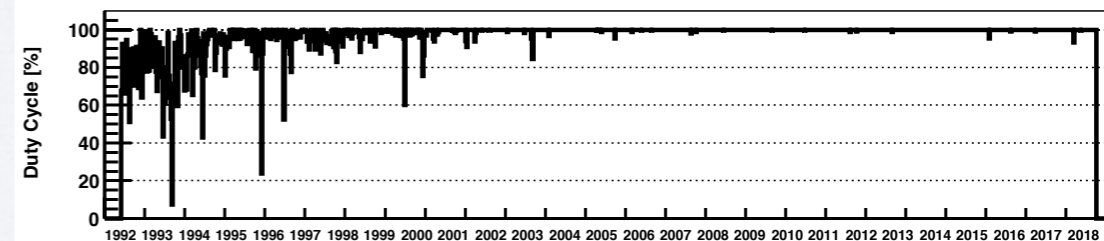
THE LARGE VOLUME DETECTOR



LVD @ LNGS, Italy
1992- Running

LVD counter
1,5 m³ - 1.2 ton

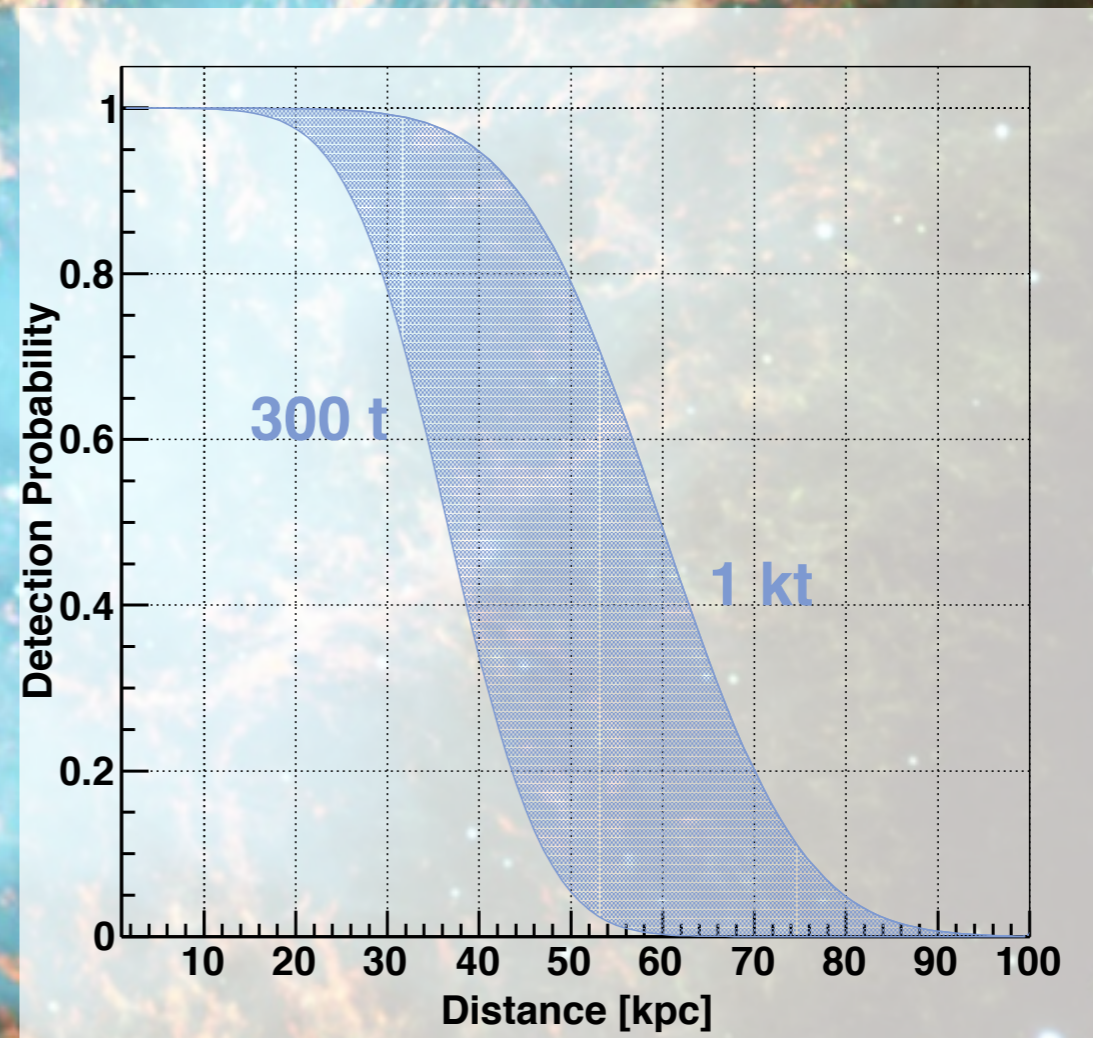
- 1 kton liquid scintillator + 0.8 kton Fe
- Depth 3600 m w.e
- 840 independent counters
- 100% Duty cycle
- Energy Threshold: $E_H \sim 4$ MeV
- 15% energy resolution @ 10 MeV
- Timing accuracy 12.5 ns (relative) / 100 ns (absolute)



LVD MAIN TASK

SN NEUTRINOS BURST

| Expected signal @ 10 kpc | Neutrino interaction channels | Expected events |
|--------------------------|--|-----------------|
| | $\nu_e + p \rightarrow e^+ + n$ | 250 |
| | $\nu_e + {}^{12}\text{C} \rightarrow {}^{12}\text{N} + e^-$ | |
| | $\nu_e + {}^{12}\text{C} \rightarrow {}^{12}\text{B} + e^+$ | 15 |
| | $\nu_i + {}^{12}\text{C} \rightarrow \nu_i + {}^{12}\text{C} + \gamma$ | |
| | $\nu_i + e^- \rightarrow \nu_i + e^-$ | 10 |
| | $\nu_e + {}^{56}\text{Fe} \rightarrow {}^{56}\text{Co} + e^-$ | |
| | $\nu_e + {}^{56}\text{Fe} \rightarrow {}^{56}\text{Mn} + e^+$ | 25 |
| | $\nu_i + {}^{56}\text{Fe} \rightarrow \nu_i + {}^{56}\text{Fe} + \gamma$ | |
| Total | 300 | |



On-line search see N.Yu Agafonova et al., *Astroparticle Physics* 28 (2008) 526-522

Off-line search see N.Yu Agafonova et al., *Astrophysical Journal* 802 (2015) 47

Periodical Data Analysis @ ICRC

The image shows a vast underground laboratory with a prominent vaulted ceiling. The interior is filled with complex scientific equipment, including large blue and orange metal structures, pipes, and scaffolding. A central vertical structure is the focal point, surrounded by various instruments and control panels. The lighting is a mix of cool blues and warm oranges, creating a high-tech atmosphere. A sign at the top center reads "PROJE MANOCMI" and "PORTATA 40".

POSTER SESSION
ID 54

**METHODS AND RESULTS OF ANALYSIS
1992-2018 DATA SET**