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Search for Potential Astrophysical Sources of High-Energy Muon Events in LVD

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One of the scientific goals of the LVD experiment is the search for neutrinos. The study of neutrinos is important for understanding particle physics and processes occurring in astrophysical objects. In this work, high-energy single-muon events are considered under the assumption that some upward-going events may be related to interactions of muon neutrinos. An algorithm was developed to convert the direction of a muon registered in the local LVD coordinate system into coordinates in the ICRS system. The algorithm then searches for possible astrophysical sources from the 4FGL-DR4 catalog within a selected angular distance. The 4FGL-DR4 is a catalog of gamma-ray sources based on 14 years of Fermi-LAT observations of the whole sky. Objects from this catalog are considered as possible candidates for high-energy neutrino sources.

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