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Expected neutrino rates from point-like astrophysical sources in Baikal-GVD

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The main objective of the Baikal-GVD neutrino telescope is to detect high-energy neutrinos from astrophysical sources, thus contributing to the advancement of modern understanding of the high-energy universe. In the present work, we estimate the total neutrino detection rate from several possible particle sources, including TXS 0506+056, NGC 1068, and the Galactic Center, assuming a hadronic emission scenario. The neutrino rate is calculated using a pre-computed detector effective area for reconstructed track-like events. The daily source movement across the sky and the detector's registration efficiency as a function of energy and zenith angle are taken into account. The attenuation of the neutrino flux in the Earth is modeled using the *νFATE* package and is also incorporated into the neutrino detection rate calculations. We conclude that with a single Baikal-GVD cluster, the typical expected neutrino registration rate from the brightest sources is of the order of 0.05 events per year. With the full configuration of Baikal-GVD, consisting of 14 clusters, the event rate may reach the level of 1 event per year, potentially allowing for a significant detection over a time scale of several years.

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