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Applying Databases, Graphana Data Visualization Program, and Python Libraries for Enhanced Follow-Up Regime of Baikal-GVD Neutrino Telescope

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The Baikal-GVD online data processing and alert system was launched at the beginning of 2021. It is designed for fast online neutrino event reconstruction and, when a potential signal from an astrophysical source is detected, sending an alert message to collaboration members. It also searches for matches between internal alerts and other astrophysical experiment alerts. This contribution describes improvements to the alert system related to alert visualization that will help better understand the alert data and its possible relation to astrophysical phenomena. The architecture of the databases used to store the alert data (MariaDB, InfluxDB, MongoDB) is described. Automation of data analysis and visualization processes occurs using specialized Python libraries (Matplotlib, Astropy, etc.), which provide various opportunities for this. The capabilities of the Grafana software system for storing visualized data with the ability to share are also being explored.

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