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Current status of the BAIKAL-GVD project

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Since 2006, the development of a km3-scale neutrino telescope - the Gigaton Volume Detector (GVD) in Lake Baikal - is the central goal of the Baikal collaboration. A prototype cluster of GVD was installed in Lake Baikal in April 2011. The cluster consists of 24 optical modules located on three strings. We present selected results obtained in the course of developing and testing key elements and systems of GVD. We furthermore describe configuration and technical design of GVD.

Summary

The objective of the Baikal Project is the creation of a kilometer-scale high-energy neutrino observatory: the Gigaton Volume Detector (GVD) in Lake Baikal. Basic elements of the GVD (new optical modules with PMTs of various types, FADC readout units, underwater communication systems) were investigated and tested in-situ with prototype strings in 2008–2010. Measurements with a LED flasher, a calibration laser, and muons allow estimating the time accuracy of the GVD measuring system at the level of about 2 ns. On the basis of the studies of the prototype strings and optical module parameters the optimization of the GVD configuration was performed. A technical design report for the GVD Baikal neutrino telescope has been prepared. A prototype cluster which comprises all key elements of the measuring and communication systems of GVD cluster was put in operation in Lake Baikal during the 2011 winter expedition.

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