



Contribution ID : 325

Type : **Oral talk**

Baksan Large Neutrino Telescope Project

Friday, 2 December 2022 18:15 (15)

A large-volume liquid scintillator neutrino detector is proposed to develop at the Baksan Neutrino Observatory of Institute for Nuclear Research of the Russian Academy of Sciences in the North Caucasus. The detector will be located at the depth of 4700 m.w.e. (meter of water equivalent). A target mass of the detector will be 10 kt. This multipurpose detector is being developed to study primarily natural neutrino and antineutrino fluxes namely fluxes of solar neutrinos, geoneutrinos and neutrinos from other astrophysical sources. This project, if implemented, would be a successor of the Borexino experiment and other European projects like LENA. The project is aimed to have a record energy resolution, which along with its location at the large depth and relatively far distance from operating nuclear reactors will allow reaching a record sensitivity to the natural neutrino and antineutrino fluxes. We report in the paper the present status of the project and describe some selective results of the project first stage – the detector prototype with liquid scintillator mass of 0.5 t. Results of R&D for the project second stage with 5 tons of liquid scintillator are presented too.

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Session Classification : Neutrino Physics

Track Classification : Neutrino physics