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Light concentrators for large-volume detector at the Baksan Neutrino Observatory

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At the Baksan Neutrino Observatory deployed in the North Caucasus mountains, it is proposed to develop, at a depth corresponding to about 4700 mwe, a large-volume neutrino detector based on a liquid scintillator with a target mass of 10 kt. The main physics goals of the detector are low-energy neutrino physics, astrophysics and geophysics. The highest possible light yield is crucial for such detectors. To improve light yield and energy resolution in large-volume neutrino detectors, light concentrators are often mounted on photomultiplier tubes to increase the detection efficiency of optical photons from scintillation or Cherenkov light induced by charged particles. We present the results of recent R&D work aimed to develop light concentrators for the Baksan large-volume liquid scintillator neutrino detector.

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