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Light detection system prototype for DUNE Near Detector TPC

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The Deep Underground Neutrino Experiment (DUNE) is an international experiment for neutrino science and proton decay studies. DUNE will consist of two neutrino detector complexes placed in the world's most intense neutrino beam. The Near-Detector complex will track particle interactions near the source of the beam, at Fermilab in Batavia, Illinois. The core component of the DUNE Near-Detector complex will be the ArgonCube Liquid Argon detector. ArgonCube proposes an advanced approach for building modular Liquid Argon Time Projection Chambers (TPCs).
To efficiently collect the scintillation light produced when particles interact within the liquid Argon TPC, a large area photon detection system is required.
JINR is developing the light detection system including front-end electronics, DAQ, and slow control which is based on the two types of a dielectric light trap with optically coupled Silicon Photomultipliers (SiPMs) for the light readout: the Light Collection Module designed and built by JINR and the ArCLight detector developed at the University of Bern. The performance of the light detection system prototype obtained in the tests of the first prototype of modular LAr TPC in Bern University will be presented.

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