The LEGEND-200 LAr instrumentation in the search of neutrinoless double beta decay
Nina Burlac on behalf of LEGEND Collaboration

590 m$^3$ tank with ultra-pure water

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WLS fiber curtains + HPGe detector array inside NMS

590 m$^3$ tank with ultra-pure water

WLSR cylinder

64 m$^3$ LAr cryostat

WLSR cylinder

LEGEND-200 overview

WLS fiber curtains + HPGe detector array inside NMS

• Detection of Ar scintillation light created by energy depositions in the LAr that accompanies energy depositions in the HPGe detectors;

• such background events originate from $\alpha$, $\beta$, $\gamma$ or neutron interactions, originating from primordial, anthropogenic radioisotopes or cosmogenic produced unstable isotopes;

• they must be discriminated from 0$\nu$\beta$\beta$ decay signals, which have energy deposition inside the HPGe detectors and no energy deposition in the LAr.

Acronyms

HPGe – high-purity germanium
LAr – liquid argon
NMS – nylon mini-shrouds
SIPM – silicon photomultiplier
WLS – wavelength shifting
WLSR – WLS reflector