The Darkside-20k neutron veto and its light detectors

Daria Santone, RHUL
On behalf of Darkside-20k collaboration

Darkside-20k is a global direct dark matter search experiment situated at Laboratori Nazionali del Gran Sasso, **designed to reach a total exposure of 200 tonne-years free from instrumental background**. The most dangerous background to the dark matter search comes from nuclear recoils induced by radiogenic neutrons, since this process can mimic a dark matter scattering-induced recoil. The DarkSide-20k detector has a novel design in which the neutron veto and the TPC are integrated into a single mechanical unit that sits in a common bath of low-radioactivity argon. The entire TPC wall is surrounded by a Gd-PMMA shell which is equipped with large area Silicon Photomultiplier (SIPMs) array detectors. SiPMs are disposed in a compact design designed to minimise the number of Printed Circuit Boards (PCBs), cables and connectors, called photodetection unit (vPDU). The preliminary results of first vPDU+ and the expected neutron veto performances will be discussed.