



Contribution ID: 10

Type: Oral

## Production and Characterization of Veto Photon-Detection Units for the DarkSide-20k Experiment

*Monday 26 August 2024 15:05 (20 minutes)*

The DarkSide-20k experiment, currently under construction at the Gran Sasso National Laboratory (LNGS), represents a significant advancement in the field of direct Dark Matter (DM) detection. Utilizing a liquid argon dual-phase time projection chamber (LArTPC) with a 20-tonne fiducial mass, DarkSide-20k is designed to extend the sensitivity limits in the search for Weakly Interacting Massive Particles (WIMPs), a leading dark matter candidate. A critical component of this experiment is the active veto system, which acts as a shield against external environmental noise to minimize background and enhance the accuracy of DM detection. The system features advanced silicon photomultiplier (SiPM)-based cryogenic photosensors for light readout, making the large mass of LAr in the detector one of the most promising current technologies for DM detection. Universities and research institutes in the UK and Poland are responsible for producing and testing 150 veto Photon Detection Units (vPDUs) that will be fitted on the Inner and Outer Veto. I will discuss the status of the production and characterization of the vPDUs, along with the quality assurance and quality control (QA/QC) procedures implemented to ensure the reliability and efficiency of the photon-detection systems.

**Author:** QUEIROGA BAZETTO, Maria Cecilia (University of Liverpool)

**Presenter:** QUEIROGA BAZETTO, Maria Cecilia (University of Liverpool)

**Session Classification:** Applications

**Track Classification:** Applications (dark matter, neutrino, precision frontier, medicine, etc.): Dark matter