



Contribution ID: 597

Type: **Parallel Talk**

Low radioactivity Argon and SiPM at cryogenic temperatures for the next generation dark matter searches

Friday, July 7, 2017 10:08 AM (17 minutes)

DarkSide-20k is a proposed 20 tonne fiducial mass liquid argon TPC that will perform an instrumental background-free search for WIMP dark matter. The TPC will be outfitted with more than 125,000 silicon photomultipliers (SiPM) grouped into 5210 single-channel, 25 cm² photosensors that are sensitive to single photoelectrons, and will be filled with low radioactivity Argon extracted from underground CO₂ wells in Cortez, Colorado in the US.

We will present the performance of the photosensor and associated low-noise electronics at liquid argon temperature and discuss the strategy for scaling up production for DarkSide-20k as well as an overview of the Urania and Aria projects which aim to extract and purify 100 kg/day of underground Argon for use in DarkSide-20k.

Experimental Collaboration

Darkside

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Session Classification: Detectors and data handling

Track Classification: Detector R&D and Data Handling