

New Technologies for Discovery IV: The 2018 CPAD Instrumentation Frontier Workshop

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Photosensors for the DarkSide-20k Experiment

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Content

DarkSide-20k is a proposed 30-tonne fiducial mass liquid argon TPC that will perform an instrumental background-free search for WIMP dark matter. The TPC will be outfitted with 200,000 silicon photomultipliers (SiPMs) grouped into 8,280 single-channel, 25 cm² photosensors that are sensitive to single photoelectrons. We will present the cryogenic performance of the first DarkSide Motherboard, a 625 cm² module that houses 25 photosensors and their associated low-noise electronics. We will also discuss the strategy for producing the full complement of DarkSide photosensors, including the transition of wafer production to a commercial foundry and the construction of a dedicated, low-background packaging facility.

Summary

Primary author(s) : GIOVANETTI, Graham (Princeton University)

Presenter(s) : GIOVANETTI, Graham (Princeton University)

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