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Cryogenic power over fiber: results from the Cryo-PoF project and tests on a remotely controlled DC/DC boost converter

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Cryo-PoF project is an R&D funded by the Italian Institute for Nuclear Research (INFN) in Milano-Bicocca (Italy) and it is based on Power Over Fiber (PoF) technology.
PoF technology delivers electrical power by sending laser light through an optical fiber to a photovoltaic power converter, in order to power sensors or electrical devices.
Cryo-PoF is inspired by the needs of the DUNE Vertical Drift detector, where the VUV light of liquid argon must be collected at the cathode, i.e. on a surface whose voltage exceeds 300 kV. To power both the Photon Detection devices and its electronic amplifier, we aim to develop a cryogenic system, solely based on opto-electronic devices and a single laser input line. The SiPM bias is given and regulated by the DC/DC converter developed by Milano Statale group. The DC/DC will include a remote control able to determinate different output voltages while operating on an external signal through an optical fiber connection at room temperature.
In this contribution are presented the results obtained during test campaign performed in Milano- Bicocca, with the emphasis on the development of the advanced DC/DC converter.

Poster prize

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