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CRYO-PoF: Cryogenic power over fiber for fundamental and applied physics at Milano-Bicocca

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The power over fiber (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.

This solution offers several advantages: removal of noise induced by power lines, robustness in a hostile environment, spark free operation when electric fields are present and no interference with electromagnetic fields.

This technology is at the basis of the CRYO-PoF project: an R&D funded by the Italian Institute for Nuclear Research (INFN) in Milano-Bicocca (Italy).

This project 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.

We aim to develop a cryogenic system, which is solely based on optoelectronic devices and a single laser input line, to power both the Photon Detection devices and its electronic amplifier.

In this talk we will present the results obtained during test campaign performed in Milano- Bicocca with emphasis on performance and potential application in the field of applied physics.

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