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Analog optical signal transmission for HEP experiments

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A critical element in all high-energy physics experiments is the signal transmission from the active elements to the data acquisition system. It is especially challenging in large volume detectors based on noble liquids that are extensively being used for dark matter and neutrino detection.

The topics of this contribution is the optical signal transmission of the signals acquired with silicon photomultipliers, which is able to satisfy many stringent experimental requirements. It is RF-noise immune and operates in cryogenic liquids and in high-electric fields.

This transmission system is based on commercially available electronics components and customized Fabry-Perot laser diodes.

I will talk about encountered challenges, breakthrough, and advances from the original concept of this system up to final validation tests, demonstrating progressive developments.

Early Career

Yes

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