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Integrated General Purpose SiPM Based Optical Module with High Dynamic Range

In this talk, we will present an integrated optical module based on SiPMs optimized for applications in plastic scintillator detectors. Hosting two $25\ \mu\text{m}$ SiPMs in parallel, three independent pre-amplifier channels are necessary to exploit the full dynamic range of the SiPMs of about 10^6 . Light guides increase the sensitive area which are optimized for the read-out of wavelength shifting fibers. The optical and electrical performance of the module has been characterized in detail in laboratory measurements. Prototypes have been installed and tested in scintillator detectors developed for AugerPrime, the upgrade of the Pierre Auger Observatory. We emphasize the importance of the large dynamic range and show results of dedicated measurements from the lab.

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