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Calibration System with Notched Fibres

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Modern detectors with significantly increasing number of active channels require new approach for calibration. The calibration system on the first prototype of the AHCAL in CALICE used one optical fibre for each of 7608 channels to distribute calibration light to tiles with SiPM. As the proposed analogue hadronic calorimeter for ILC should have around 10^6 channels, the former system is inapplicable due to spatial requirements and manufacture difficulties. Now two ways of light distribution are considered. The first one is focused on the implementation of one LED placed directly on PCB for each SiPM channel. The second one is focused on a simplified fibre distribution system using one fibre with taps for more channels. It uses so called notched fibre and will be presented here. The system allows to calibrate one row of 72 scintillation tiles read by SiPMs using one driver with one LED and three subsequent notched fibres. We will present principals, parameters of current system and requirements for future development to allow reliable manufacturing. Benefits and drawbacks of notched fibre system with a comparison to the system with embedded LED for each SiPM channel is also discussed.

Further we report on latest version of the electronics for calibration and monitoring system developed for single UV-LED. The system is based on original fast (3 ns pulsewidth) and precise LED driver called QMB. Due to its high dynamic range of precise a few nanosecond pulses it is flexible to all necessary monitoring and calibration task for SiPM like detectors.

Primary authors: POLAK, Ivo (Acad. of Sciences of the Czech Rep. (CZ)); SMOLIK, Jan (Acad. of Sciences of the Czech Rep. (CZ))

Presenter: SMOLIK, Jan (Acad. of Sciences of the Czech Rep. (CZ))

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