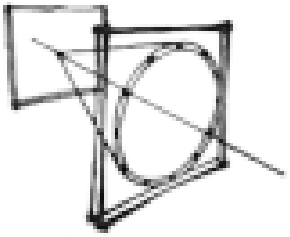

Contribution ID: **21** Type: **Oral presentation**

The TORCH PMT, a close packing, long life MCP-PMT for Cherenkov applications with a novel high granularity multi-anode

Tuesday, 6 September 2016 10:55 (25 minutes)

Photek are currently in a three year development program to produce a novel square PMT for the proposed TORCH detector which is being developed within an ERC project, with potential application in a future upgrade of the LHCb experiment around 2023. The PMT will be MCP based for the inherent timing accuracy that this brings, and has three main novel features that need to be developed:
1. Long lifetime, it should be able to produce 5 C / cm2 of accumulated anode charge without noticeable degradation in sensitivity.
2. Multi-anode output with an effective spatial resolution of 128 × 8 pixels within a 53 mm x 53 mm working area.
3. Close packing on 2 opposing sides with an active width fill factor target of 88% in one direction.

We will present further evidence of the significant beneficial effect that an ALD (Atomic Layer Deposition) coating on the MCPs has on the life time of an MCP-PMT.

We have developed a novel anode design that combines the image charge technique with a patterned anode, and uses a charge sharing algorithm that produces an inter-pad position resolution beyond the granularity of the pads themselves: 0.225 mm FWHM (0.1 mm rms) derived from pads on a 0.83 mm pitch. We will also show initial results using the multi-channel NINO ASIC and the first multi-anode tube prototypes.

We will present results from the first square PMT prototypes demonstrating the required fill factor ratio.

Registered

Yes

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