

Latest Technological Advances with Microchannel-Plate PMTs

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Since the recent success in solving the long-standing aging issues of MCP-PMTs by applying an atomic layer deposition (ALD) technique to the MCP pores, these fast and B-field tolerant devices have become very attractive sensors for future experiments. Moreover, significant improvements in collection (CE) and quantum efficiency (QE) allow a $DQE=QE*CE$ of ~30%. The DIRC detectors of the PANDA experiment at FAIR will be read out by ALD-coated MCP-PMTs in 8x8 and 3x100 anode designs.

The talk will discuss the most recent advances with MCP-PMTs. The status in terms of lifetime, DQE, rate capability, time resolution, and their behavior in B-fields will be summarized. In a new setup up to 300 anode pixels can be read out simultaneously allowing a glance “inside the PMT”. Parameters like dark count rates and ion afterpulsing are measurable as a function of the incident photon position as well as the temporal and spacial spread of recoil electrons and electronic and charge-sharing crosstalk.

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