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ROPPERI - A TPC readout with GEMs, pads and Timepix

A novel anode readout structure for time projection chambers is presented. It combines GEM amplification with small pads on a separate PCB (for flexibility) and a pixel chip, the Timepix, as on-board digitization electronics (for high integration). Pad sizes in the order of a few 100 μm allow for the identification of the initial electron clusters which leads to an improvement of particle identification capabilities via dE/dx .

This poster summarizes the hardware development, highlighting the challenges of the production, as well as the analysis of noise data of the second-generation boards, showing the principal feasibility of the technology. The adapted MarlinTPC simulation chain, including usage of the astrophysics software 'Source Extractor' for cluster identification, gives performance prospects of a future intermediate or large scale system.

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