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Design and Characterization of the VMM1 ASIC for Micropattern Gas Detectors

We present here the measurements of the first prototype VMM1 ASIC designed at Brookhaven National Laboratory in 130 nm CMOS and fabricated in spring 2012. The 64-channel ASIC features a novel design for use with several types of micropattern gas detectors. The data driven system measures peak amplitude and timing information in tracking mode and first channel hit address in trigger mode. Several programmable gain and integration times allows the flexibility to work with Micromegas, Thin Gap Chambers (TGCs), and Gas Electron Multiplier (GEM) detectors. The IC design architecture and features will be presented along with measurements characterizing the performance of the VMM1 such as noise, linearity of the response, time walk, and calibration range. The concept for use with Micromegas in ATLAS Upgrade will also be covered including characterization under test beam conditions.

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ATLAS

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