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A "system on chip"(SOC) front end ASIC for the ATLAS New Small Wheels (NSW) and future upgrades

The ATLAS New Small Wheels (NSW) Phase I Muon System upgrade will use Micromegas and small-strip Thin Gap Chambers (sTGC) as both trigger and precision tracking detectors. A new ASIC, the VMM, is being developed for the front end of both detector technologies. The VMM is a sophisticated ASIC, System on Chip (SOC), providing digitized amplitude and time information as well as independent trigger paths for both detector systems. We describe the details of the properties of the VMM ASIC, its programmability, its proposed use with the NSW electronics trigger and readout architecture, and possible use in future upgrades. As an example the application of the VMM in the ATLAS HL-LHC muon upgrade will be presented. The similarity to the Phase I system and the resulting benefits will be stressed.

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