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# New large area Micromegas detector and readout ASIC for the AMBER experiment at CERN

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The Apparatus for Mesons and Baryon Experimental Research (AMBER, NA66) is a high-energy physics experiment at CERN's M2 beam line. Its broad physics program presently extends beyond 2032 and comprise measurement of the anti-proton production cross-section on He, proton and Deuterium, charge-radius of the proton and Kaon and Pion PDFs using Drell-Yan process. Several major upgrades of the spectrometer are planned for the medium and long-term AMBER program. Among those several resistive bulk MICRO-MEsh-GAseous Structure (MM) detectors designed together with the CERN MPT workshop are planned. Detectors having an active area of 1x0.5 $m^2$ will be used to substitute aging MWPCs of the spectrometer. Each Micromegas have two readout planes in a face-to-face configuration with a common cathode providing a combined XUV track measurement. Resistive layer is a uniform Diamond-Like Carbon (DLC) of 10 MΩ/$square$. Present prototypes are the largest resistive bulk MM under test. To have achieve an optimal integration with the new detectors and native integration into the new trigger less DAQ a closely tailored to the MM specifications custom 64 channel fully digital front-end ASIC ToRA (Torino Readout for AMBER) providing timing and energy measurements is designed at INFN sez. Torino. Simultaneous design of the ASIC and associated detector aims to achieve an optimum performance of the system.
The production of the first detector was completed in October 2024, a test campaign is underway at AMBER experiment.

Design aspects of the MM detector and ToRA ASIC together with the first test results of the MM prototype will be presented.

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