

# The industrial production of Micro Pattern Gaseous Detector: experience from the ATLAS Micromegas

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Resistive Micromegas is one of the detector technologies chosen by ATLAS for the Phase-1 upgrade of the Muon Spectrometer, completed in 2022 in view of the LHC Run3 start. It is the largest MPGD-based detector system ever built, covering an active area of  $1280 \text{ m}^2$ , providing trigger and precise tracking capabilities to the ATLAS Muon system and able to stand a radiation background rate up to  $20 \text{ kHz/cm}^2$ . The heart of the ATLAS Micromegas detectors is the anode board, which carries the resistive protection layer, the readout electrodes and the insulating spacers supporting the micro-mesh. The production of the 2048 readout boards of size up to  $0.5 \times 2.2 \text{ m}^2$  has been assigned to high-technology PCB industries and required dedicated efforts for technology transfer, production follow-up and quality assurance and control. The talk will review the main challenges from the design phase to the completion of the project which spanned over several years. Emphasis will be put on the technical improvements introduced during the industrial production, the thorough QA/QC protocol established, the achieved results, as well as on logistic, supply and schedule constraints. The lessons learned from this unprecedented MPGD project will also be drawn.

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