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Pixelised Resistive Micromegas for Tracking Detectors in Future Particle Physics Experiments

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In this contribution, we present a development of resistive Micromegas (MM) technology to reach stable and efficient operation up to particle fluxes of 10 MHz/cm². This can be achieved with a pixelized detector using readout pads of a few mm² area, significantly reducing the occupancy of the readout elements. In the most recent prototypes (exploiting double DLC layer), the resistive layer is continuous and uniform and the charge is evacuated through many dot-connections, several mm apart. An overview of the measured performance in terms of gain, rate capability and recent results on time, efficiency, and spatial resolution from test-beam campaigns is reported for the latest small area prototypes. Different gas-mixtures have been tested and compared, as well.

Moving towards a larger scale, a new detector with an active area of 400 cm² has been built, implementing a double layer of DLC foils with a surface resistivity around 30 MOhm/square. Results will be reported following laboratory and test beam measurements.

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