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Development of the Time-Of-Flight System of the CBM Experiment (CBM)

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The main goal of CBM is the investigation of the phase diagram of strongly interacting matter in the region of the highest baryon densities. In order to measure the necessary observables with unprecedented precision an excellent particle identification is required. The key element providing hadron identification at incident energies between 2 and 35-AGeV is a 120-m² large Time-of-Flight (ToF) wall composed of Multi-gap Resistive Plate Chambers (MRPC). The most demanding challenge, however, is the enormous incident particle fluxes between 100-Hz/cm² and 25-kHz/cm² generated at the highest interaction rates that CBM is designed for (10-MHz). In this contribution we will present various MRPC prototypes developed by the CBM-ToF group. In particular the rate capability of ceramic MRPCs and low resistive glass MRPCs for the high rate region as well as float glass MRPCs for the lower rate region will be discussed. The current conceptual design of the ToF-wall which is based on a modular structure composed of modules containing the MRPC counters will be presented.

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