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mTOF performance during mCBM beam time at GSI

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The future Facility for Anti-proton and Ion Research (FAIR), currently in construction in Darmstadt, Germany, is one of the largest research projects world wide. The Compressed Baryonic Matter (CBM) experiment is one of the main pillars at FAIR, studying the quantum chromodynamics (QCD) phase diagram at high baryon densities with unprecedented interaction rate in heavy ion collisions up to 10 MHz. This requires new free-streaming data acquisition methods, new data analysis concepts and high-rate capable detector systems. The task of the CBM Time of Flight wall (CBM-TOF) is the charged particle identification. Multi-gap Resistive Plate Chambers (MRPCs) with different rate capabilities will be used at their corresponding regions. To reduce the commissioning time for CBM, a CBM full system-test-setup called mini-CBM (mCBM) has been installed and tested by beams at GSI SIS18 facility in 2019. The high-rate MRPC prototypes developed at Tsinghua University, called MRPC3a, were selected to be implemented in mTOF modules for mCBM. Additional thin float glass MRPCs from USTC, foreseen for the CBM low rate region, were also tested in mCBM experiment. Performance results from these prototypes analyzed by the so called tracking method will be the scope of the talk.

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