

## The Transition Radiation Detector in the CBM Experiment at FAIR

The Compressed Baryonic Matter (CBM) experiment will be one of the research pillars of FAIR (Darmstadt, Germany), which is currently under construction. High-intensity heavy-ions beams delivered by the SIS100 accelerator (FAIR Phase 1) will be used to explore the QCD phase diagram at high baryon densities. Interaction rates of up to 10 MHz on a fixed target will enable measurements at an unprecedented level of precision and will allow access to rare probes like, e.g., multi-strange hyperons and hyper-nuclei. The in-medium mass modification of vector mesons can be measured via lepton pairs, and excitation functions of various observables will serve as sensitive probes for phase transitions.

At the planned interaction rates, the CBM experiment has to meet the challenge of very high hit rates in the detectors. This poster will focus on the Transition Radiation Detector in CBM, which is foreseen as a 4-layer design with thin Xe-filled MWPCs (3.5+3.5 mm amplification and 5 mm drift volume) and PE-foam based radiators. To cope with the high hit densities in the inner detector region, detector modules with high readout granularity in 2D are being developed. High-rate tests of the default MWPCs at the CERN Gamma Irradiation Facility (GIF) will be covered as well as measurements of the MWPC and radiator response to electron beams provided by DESY. The TRD readout concept which interfaces to a newly developed performant, self-triggered and free-streaming DAQ system will be sketched.

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