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The Compressed Baryonic Matter (CBM) Experiment at FAIR

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

After an introduction into the physics program of CBM, this talk will focus on the instrumentation of the experiment. Suiting the conducted collision rates, the CBM detectors will be built in a fast and radiation-hard design. The self-triggered and free-streaming read-out concept will be presented and the online event selection on a high-performance computing cluster will be covered. As examples, detector characteristics and recent test beam results will be discussed for the Silicon Tracking System (STS), for the Muon Chambers (MuCh) and for the Transition Radiation Detector (TRD). An outlook on the status of the next major step of system integration, namely miniCBM in FAIR Phase 0, will be given.

Content type

Experiment

Collaboration

CBM

Centralised submission by Collaboration

Presenter name already specified

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