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Perspectives of QCD phase diagram studies with the CBM experiment at FAIR

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The future heavy ion experiment CBM at the FAIR facility will study the QCD phase diagram in the region of high baryon chemical potential at relatively moderate temperatures, where a complex structure is predicted by modern theories. In order to detect possible signatures of this structures, the physics program of the experiment includes a comprehensive study of the extremely rare probes like charmed particles, dileptons, multi-strange particles, hypernuclei and their antiparticles. The multi-differential analysis of spectra, flow, collective effects will be performed even for such rare particles with the unprecedented precision.

To achieve the goals the operation scenario assumes extremely high interaction rates of up to 10^7 collisions per second. To cope with such conditions the beam will have no bunch structure and CBM will operate with self-triggered front end electronics and free streaming data. The detectors should be fast and efficient. Having no clear signatures for the hardware trigger, CBM will perform the full event reconstruction online including the stage of track and short-lived particle reconstruction. Fast and efficient reconstruction algorithms are being developed.

Selected session

Heavy Ion Collisions and QCD Phases

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