

# Performance study of the realistic Muon Detector system in detection of low mass vector mesons in CBM experiment at FAIR

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The Compressed Baryonic Matter (CBM) experiment at the Facility for Antiproton and Ion Research (FAIR) in Darmstadt, Germany is an upcoming fixed target experiment which will perform the precision measurement of di-lepton pairs in the full mass region (low mass to charmonium) in the energy range 10 - 40 AGeV using high-intensity ( $\sim 10^9$  ions/ sec) heavy-ion beams. Leptons being weakly interacting, remain unaffected by the final state interactions, and act as one of the cleanest channel to explore the fireball created in heavy ion collisions. The objective of the MUon CHamber (MUCH) detector in the CBM experiment is to study the di-muon spectra at different mass regions. One of the major experimental challenges for the CBM experiment in the FAIR energy regime is the identification of low momentum muons, originating from the decay of low-mass vector mesons (LMVM), in a very high particle density environment. At low invariant masses, di-leptons offer valuable information on the in-medium modification of vector mesons which is a promising observable for the chiral symmetry restoration. Till date, no di-lepton measurements are available for heavy-ion collisions in the FAIR energy range. Here we will report the performance of the latest CBM MUCH detector, characterized by the detection efficiency and signal-to-background ratio for LMVM ( $\rho$ ,  $\omega$ ,  $\phi$ ,  $\eta$ ).

## Presentation type

Oral

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