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Quarkonium and open heavy-flavour measurements in the NA60+ experiment

The NA60+ experiment, proposed for data taking in the next years, aims to explore the high baryochemical potential region within the QCD phase diagram, exploiting the high-intensity beams from CERN SPS. Through a beam-energy scan involving Pb-Pb and p-A collisions in the range $6.3 < \sqrt{s_{NN}} < 17.3$, NA60+ is ideally positioned to access the high μ_B region of the QCD phase space.

This talk will focus on prospects for measurements of hidden and open charm. Open charm particles will be identified through their decays into charged hadrons, with decay products from tracks reconstructed in the vertex telescope's silicon detectors. High-precision measurements of D^0 , D^+ , D_s mesons, and Λ_c^+ baryon will enable us to better constrain the transport properties of the QGP and understand charm-quark hadronisation.

Charmonium states, detected via their dimuon decays, will be reconstructed by matching muon tracks between the vertex telescope and the muon spectrometer. Measurements of J/ψ and $\psi(2S)$ across various collision energies will shed light on the onset of charmonium suppression within a deconfined medium, allowing us to correlate this suppression with the system temperature, measured by NA60+ using thermal dimuons, across various collision energies and in different collision systems.

Finally, the competitiveness and complementarity of NA60+ heavy-flavour measurements in the landscape of the experiments foreseen at other facilities in the next decade will be discussed.

Category

Experiment

Collaboration (if applicable)

NA60+

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