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Tomography of the QGP by open charm and bottom mesons

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Study of the radiative and collisional energy loss of heavy quarks in a QGP and the following hadronisation. Analysis of the recent RHIC and LHC B and D meson data.

Summary

One of the primary goals of the relativistic heavy ion program at RHIC and LHC is the study of the properties of the QGP. This is not that easy because light quarks seem to come to a thermal equilibrium at the end of the expansion and therefore light hadrons show only the properties at the phase transition points. Heavy quarks, on the contrary, do not come to equilibrium with the environment and therefore the final heavy meson spectra carries information on the early stage of the QGP expansion. We have developed a pQCD based model for the elementary interaction of heavy quarks with the plasma particles and studied the heavy quark interaction with the expanding QGP in a transport theory where the plasma is described by a hydrodynamical approach. In particular we study the energy loss and the elliptic flow and compare the results with recent experimental data. Emphasis will be put
on the influence of an absorptive medium on the radiative energy loss and the Landau Pomeranchuck Migdal effect which we have recently studied in detail.

We compare our results with RHIC and LHC data and draw conclusions about the properties of the early expansion phase of the plasma.

Presentation Type

oral

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