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Characterizing quark gluon plasma by Heavy Flavors

The drag and diffusion coefficients of charm and bottom quarks propagating
through quark gluon plasma (QGP) have been evaluated for conditions
relevant to nuclear collisions at Large Hadron Collider (LHC)
and at Relativistic Heavy Ion Collision (RHIC).
The dead cone and Landau-Pomeronchuk-Migdal (LPM) effects on
radiative energy loss of heavy quarks have been considered.
Both radiative and collisional processes of energy loss are included
in the {\it effective} drag and diffusion coefficients.
With these effective transport coefficients we solve the Fokker Plank (FP)
equation for the heavy quarks executing Brownian motion
in the QGP. The solution of the FP equation has been used to
evaluate the nuclear suppression factor, R_{AA} and elliptic flow v_2 for the
non-photonic single electron spectra resulting from the semi-leptonic decays
of hadrons containing charm and bottom quarks. It is observed that
the experimental data from RHIC on R_{AA} and v_2
of nonphotonic electrons can be reproduced simultaneously within the
pQCD framework for the same set of input. The R_{AA} and v_2 of the
non-photonic electron from heavy meson
decays produced in nuclear collisions at LHC and low energy RHIC
run have also been predicted.The effects of mass on R_{AA}
has also been highlighted.

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