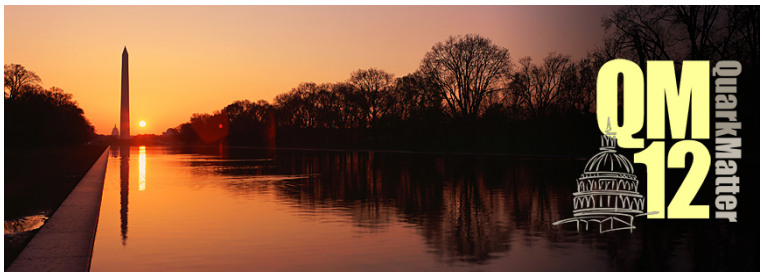

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Heavy-quark diffusion at the LHC within a UrQMD-hydrodynamical hybrid model

Thursday, August 16, 2012 4:00 PM (2 hours)

Heavy charm and bottom quarks provide an important probe of the transport properties of the quark-gluon plasma, created in heavy-ion collisions at the Large Hadron Collider (LHC). They are produced in the early hard collisions and then interact with the hot and dense medium, consisting of light quarks and gluons, undergoing a phase transition to a hot and dense hadron gas. Using a hybrid model of Ultrarelativistic Molecular Dynamics (UrQMD) and 3D hydrodynamics [1] to simulate the evolution of the hot and dense medium, we describe heavy-quark interactions with the medium in terms of a Fokker-Planck/Langevin framework with drag and diffusion coefficients based on a Dirac-Brueckner evaluation of the in-medium scattering-matrix elements using lattice QCD heavy-quark potentials for elastic light-heavy-quark scattering [2] or a phenomenological resonance-scattering model based on chiral and heavy-quark effective theory [3] to evaluate the nuclear modification factor, R_AA, and elliptic flow v_2 of D- and B-mesons in PbPb collisions at sqrt(s_NN)=2.76 TeV. The results are compared with recent data from the ALICE collaboration on R_AA and elliptic flow of single electrons, muond, and D-mesons.

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