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Bottomonia suppression in heavy-ion collisions

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The thermal suppression of heavy quark bound states represents an ideal observable for determining if one has produced a quark gluon plasma in ultrarelativistic heavy-ion collisions. In recent years, however, a paradigm shift has taken place in the theory of quarkonium suppression due to new first principles calculations of the thermal widths of these states. These thermal widths are large, eg O(20-100 MeV) for the Upsilon, and cause in-medium suppression of the states at temperatures below their traditionally defined disassociation temperatures. In order to apply the newly developed understanding to phenomenology, however, one must make detailed 3+1d dissipative hydrodynamical models of the plasma including the effects of finite shear viscosity. These effects include not only the modification of the time evolution of the temperature of the system, flow, etc., but also the emergence of potentially large local momentum-space anisotropies which can affect the in-medium properties of the states. I will discuss the setup for these model calculations and present comparisons of theory with data from RHIC 200 GeV/nucleon Au-Au collisions, LHC 2.76 TeV/nucleon Pb-Pb, and LHC 5.023 TeV/nucleon Pb-Pb collisions as a function of number of participants, rapidity, and transverse momentum.

Preferred Track

Quarkonia

Collaboration

Not applicable

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