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Heavy Flavor Production from Soft Collinear Effective Theory

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The quark-gluon plasma (QGP) predicted to have existed in the early universe can be reproduced in heavy-ion collisions at RHIC and the LHC. Rare high energy probes produced in these collisions, which traverse the hot and dense QCD medium, provide an excellent tool to probe this new state of matter. In particular, the medium modification of heavy flavor production cross sections has received growing attention in recent years. We consider the nuclear modification factor R_{AA} which is most commonly used to study the quenching of hadron or jet production yields in heavy-ion collisions. We present new theoretical calculations beyond the traditional framework of parton energy loss based on recently developed techniques using Soft Collinear Effective Theory (SCET). In particular, we consider the medium modification of heavy meson and J/ψ cross sections. In addition, we present new results for the modification of tagged $b-$jets and jet-substructure observables in heavy-ion collisions.

On behalf of collaboration:

None

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