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Study of mass hierarchy in heavy flavor suppression

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The forthcoming measurements at RHIC and LHC will generate heavy flavor data with unprecedented precision, providing an opportunity to utilize high-p_T heavy flavor data to analyze the interaction mechanisms in the quark-gluon plasma. Experimentally observed suppression mass hierarchy, and investigation of the dead-cone effect in radiative energy loss, inspired us to study the mass hierarchy in heavy flavor suppression more thoroughly.

To this end, we employ the recently developed DREENA framework, which is based on our dynamical energy loss formalism. Thus [1] we present 1) How to distinguish between different interaction mechanisms (i.e., radiative and collisional energy losses) at the same dataset. 2) A novel observable, which is sensitive only to the collisional energy loss, that is robust to collision energy, system (size), and centrality. 3) Analytical derivation of a direct relation between collisional suppression/energy loss and heavy quark mass; 3) Analytical and numerical extraction of the mass ordering in collisional energy loss through this observable.

References
1. Bojana Ilic and Magdalena Djordjevic, arXiv:2203.06646 [hep-ph] (under review in Phys. Rev. C).

Primary author: ILIC (BLAGOJEVIC), Bojana (Institute of Physics Belgrade)

Co-author: DJORDJEVIC, Magdalena (Institute of Physics Belgrade)

Presenter: ILIC (BLAGOJEVIC), Bojana (Institute of Physics Belgrade)

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