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A new insight on mass hierarchy in heavy flavor suppression

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The inherent characteristic of parton energy losses, both radiative and collisional, in QGP is the evident flavor dependence. Experimentally observed suppression mass ordering, as well as comprehensively studied dead-cone effect in radiative energy loss, encouraged us to address the mass hierarchy in heavy flavor suppression more thoroughly.

With this goal in mind, we employ the recently developed DREENA framework, which is based on our dynamical energy loss formalism. This enables us [1] to present 1) A novel observable, which is sensitive only to the collisional energy loss. This observable is robust to collision energy, system (size), and centrality, while proposing a new way to utilize high- p_{\perp} heavy flavor data. 2) Analytical derivation of a direct relation between collisional suppression/energy loss and heavy quark mass; 3) Analytical and numerical extraction of the mass hierarchy in collisional energy loss through this observable, to be more rigorously tested by the forthcoming high-luminosity measurements at the RHIC and the LHC.

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

Preferred track

Hadronic Issues in Heavy-Flavour Physics

Subfield

Nuclear theory

Attending in-person?

Yes

On behalf of collaboration?

Primary author: Dr ILIC (BLAGOJEVIC), Bojana

Co-author: DJORDJEVIC, Magdalena

Presenter: Dr ILIC (BLAGOJEVIC), Bojana

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