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Heavy quark dynamics in QCD matter

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We address the difficulties of the present theoretical approaches to have a self-consistent description of the experimental data at both RHIC and LHC. In particular a puzzling relation between the nuclear modification factor $R_{AA}(p_T)$ and the elliptic flow $v_2(p_T)$ related to heavy quark has been observed which challenged existing models. We discuss, comparing different models and approaches, how the temperature dependence of the heavy quark drag coefficient and/or the \hat{q} can account for a large part of such a puzzle.

We point out that for the same $R_{AA}(p_T)$ one can generate 2-3 times more v_2 depending on the temperature dependence of the heavy quark drag coefficient. We discuss how the $R_{AA}(p_T)$ and $v_2(p_T)$ tension can be further improve by means of a comparison in between the full solution of the Boltzmann collision integral with the Fokker-Planck equation. We highlight the impact of radiation as well as external magnetic field on heavy quark $R_{AA}(p_T)$ and $v_2(p_T)$.

[1] S. K. Das, F. Scardina, S. Plumari, V.Greco Phys.Rev. C90 (2014) 044901

[2] S. K. Das, F. Scardina, S. Plumari, V.Greco, Phys.Lett. B747 (2015) 260-264

On behalf of collaboration:

None

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