

Coupled dynamics of heavy and light flavor flow harmonics from EPOSHQ

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Heavy-flavor observables are excellent probes of the properties of the in-medium interactions, the medium properties and the degrees of freedom of the quark-gluon plasma created in heavy-ion collisions. Progressing toward a quantitative description, we describe, in EPOSHQ, the dynamics of heavy quark coupled systematically to the EPOS3 model: heavy-quarks are produced from the EPOS3 flux tube initial conditions both in momentum and in coordinate space and subsequently propagated in parallel to the fluid dynamical evolution of the viscous QGP. Hadronization of the heavy quarks via coalescence and fragmentation and particlization of the fluid enable us to investigate the importance of the final hadronic rescatterings on the heavy-flavor observables.

This global description allows us to draw conclusions from the comparison to a variety of heavy-quark observables in different systems and constrain important aspects in our underlying model for the in-medium interaction, such as the contributions stemming from elastic and inelastic energy loss, or the mass dependence by comparing charm and bottom quark dynamics. In this contribution we address the question of the event by event (EBE) correlation between flow harmonics of heavy and light mesons. At low transverse momentum, we find a good correlation of average flows but unexpectedly large fluctuations of EBE v_2 and v_3 for heavy flavors, which cannot be explained by the usual scheme relying on underlying common bulk flow. We then investigate whether such fluctuations could originate from initial state effect regarding heavy quark distribution, offering possible new perspectives on the thermalization of heavy quarks in the quark gluon plasma.

List of tracks

Heavy-flavour (open and hidden)

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