

Heavy quark diffusion along temperature and density axes

We have explored the heavy (charm) quark drag and diffusion coefficient along the two extreme directions - temperature axis at zero baryon chemical potential and baryon density axis at finite temperature. Quark condensate melts down as we go along either temperature axis or density axis. Hence, being proportionally connected with condensate, constituent quark mass also melts down to current quark mass. Using the lattice QCD calculation predicted condensate profile, we have provided the heavy quark drag, diffusion estimation along temperature axis. On the other hand, using chiral model based condensate profile, we have estimated the same along the density axis. In both results, we have shown the non perturbative QCD contribution by using the temperature and density dependent constituent quark mass from LQCD and chiral model respectively and also by comparing with the current quark mass estimation.

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