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Drag and diffusion coefficients of charm quarks in a hot QCD medium

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In order to understand the behavior of the Quark-Gluon Plasma(QGP), heavy quarks can be very essential tools. Our study offers insight into the interaction of the charm quark in the thermalized, deconfined medium. The information about the charm quark interaction in the medium is incorporated into its drag and diffusion coefficients. As the relaxation time of the charm quark is expected to be much higher than that of the light quarks, the heavy quarks can carry out information about the medium. In this work, using the Color String Percolation Model (CSPM), we have estimated the relaxation time (τ_c), drag coefficient (γ), and transverse momentum diffusion coefficient (B_0) of charm quark as functions of temperature. We have also computed the spatial diffusion coefficient (D_s) as a function of T/T_c. We have finally compared our results with various phenomenological models and the lQCD data. At around the critical temperature, T_c, we find D_s to be minimum, which indicates a significant increase in the interaction strength of the charm quarks in the medium.

Session

Heavy Ions and QCD

Author: GOSWAMI, Kangkan (Indian Institute of Technology Indore)

Co-authors: SAHU, Dushmanta (Indian Institute of Technology Indore (IN)); SAHOO, Raghunath (Indian Institute of Technology Indore (IN))

Presenter: GOSWAMI, Kangkan (Indian Institute of Technology Indore)

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