

Heavy Quark Dynamics in Hot QCD Matter: A Fractional Approach

The dynamics of heavy quarks (HQs) in a hot QCD medium are revisited with a focus on anomalous diffusion, modelled through the fractional Langevin equation using the Caputo fractional derivative. A numerical method is developed to solve the FLE, demonstrating that the mean square displacement of the HQs deviates from the standard linear time dependence. The study also calculates the mean squared momentum, momentum spread, and the nuclear suppression factor (R_{AA}) for the HQs. The presence of the superdiffusion impacts the R_{AA} significantly.

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