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Non-perturbative Heavy Quark diffusion in the non-eikonal domain of the gluon bremsstrahlung

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Drag and diffusion coefficients of the Heavy Quarks (HQs), such as charm and bottom, are one of the prime tools for discerning the properties of the deconfined QCD medium created in the heavy ion collisions experiments. The innate non-perturbative nature of the QCD medium renders it imperative to estimate the transport coefficients in that domain. The present work evaluates the drag and diffusion coefficients of the moving HQ interacting with the medium particles via two-body collisional and three-body radiative processes to the first order in opacity by employing Gribov mechanism for the non-perturbative regime. We proffer the latest results of the HQ transport coefficients computed for the non-perturbative and non-eikonal gluon radiation off the HQ. We emphasize particularly on the importance of the non-eikonality in the non-perturbative domain. The calculations show significant increment of the transport coefficients with the increasing non-eikonality by juxtaposing the results with those of the perturbative and eikonal regions. We hope to shed fresh light towards explaining the experimental data on the nuclear modification factor, R_{AA}, the elliptic flow, v_2 of the HQ by advocating the importance of the non-eikonality of the gluon radiation off the HQ.

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