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Typ: Talk

Classical vs. Quantum Corrections to Jet Broadening in a Weakly Coupled Quark-Gluon Plasma

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The transverse momentum broadening coefficient serves as a key ingredient in characterising the quenching of a jet as it propagates through the QGP. While it has recently been understood to receive quantum, radiative corrections featuring potentially large logarithmic enhancements at relative order g^2 [1, 2], it is still not clear how these corrections compare quantitatively with their classical counterparts, i.e. those coming from the exchange of thermal gluons with large occupation number, present at relative order g and higher [3–5].

During the talk, I plan to first motivate the need for a more careful calculation of the aforementioned logarithmic corrections in the case of a weakly coupled QGP. I will then sketch how the argument of the leading logarithm is altered with respect to earlier calculations and furthermore, how the phase space giving rise to these logarithmic corrections is smoothly connected to that from which the classical corrections emerge. Finally, I will conclude by discussing how these findings, detailed in our own work [6] are relevant with respect to the overall goal of determining which class of corrections are quantitatively more important.

[1] T. Liou, A. Mueller and B. Wu 1304.7677

[2] J.P. Blaizot, F. Dominguez, E. Iancu and Y. Mehtar-Tani 1311.5823

[3] S. Caron-Huot 0811.1603

[4] M. Panero, K. Rummukainen and A. Schäfer 1307.5850

[5] G.D. Moore and N. Schlusser 1911.13127

[6] J. Ghiglieri and E. Weitz 2207.08842

Experiment/Theory

Theory/Phenomenology

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