PANIC2021 Conference



Contribution ID: 253

Type: Talk

Medium induced gluon spectrum in the Improved Opacity Expansion

Sunday 5 September 2021 13:54 (18 minutes)

Over the last decades, analytical calculations of jet quenching observables were force to always make a distinction between jet evolution in dense or dilute mediums. Although there are different theoretical formalisms suited for each one of these scenarios, taking into account multiple soft and single hard interactions between the probe and the background under a single approach has proven to be a difficult task. In this talk, I will introduce the Improved Opacity Expansion (IOE), which extends the well known Opacity Expansion framework beyond the hard momentum transfer tail to the regime captured by the BDMPS-Z/ASW approximation. I will focus on the application of the IOE to the computation of the single gluon medium induced spectrum from a hard parton, which constitutes one of the most important theoretical results in jet quenching theory.

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Session Classification: Hot and dense matter physics - QGP and heavy ion collisions

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