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Gluon emission by a quark-antiquark antenna with realistic parton-medium interactions

The spectrum of coherent gluon radiation from a quark-antiquark pair experiencing multiple scatterings within a coloured medium is central for understanding in-medium parton cascades. Despite its foundational importance, current results are limited by reliance on simplified scattering rates, such as the harmonic oscillator approximation, valid only in restricted phase-space regions. Using the formalism introduced in [1], we express the gluon emission spectrum as a set of differential equations that can be solved numerically, circumventing conventional approximations. We present the transverse momentum and energy distributions of emitted gluons for realistic interaction models, illustrating the breakdown of color coherence across the entire accessible phase-space, and consequently enabling a higher-precision description of jet observables.

[1] Andrés, Apolinário, Dominguez, JHEP 07 (2020) 114

Category

Theory

Collaboration (if applicable)

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