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Improved opacity expansion for medium-induced parton splitting

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Medium-induced parton splitting is the building block for jet evolution in the presence of a hot QCD medium and plays a central role in quantitative studies of jet quenching. It exhibits two regimes: the one dominated by one single hard scattering at high frequency, and the other by multiple soft scattering at low frequency. A closed analytic formula encompassing both regimes is so far lacking. Some progress in this direction was recently achieved [1,2], where we propose an improved opacity expansion approach in which instead of expanding around vacuum the expansion is performed around the harmonic oscillator providing a better convergence of the series at low frequencies. We show that the first two orders account for the two known analytic limits.

[1] Y. Mehtar-Tani, "Gluon bremsstrahlung in finite media beyond multiple soft scattering approximation," arXiv:1903.00506 [hep-ph] (to appear in JHEP)

[2] Y. Mehtar-Tani, K. Tywoniuk, in preparation

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