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## In-medium jet evolution: interplay between broadening and decoherence effects

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The description of the modifications of the coherence pattern of the parton shower when in the presence of a QGP has been actively addressed in recent studies. Among the several achievements, finite energy corrections, transverse momentum broadening due to medium interactions and interference effects between successive emissions has been extensively improved as they seem to be essential features for a correct description of heavy-ion collisions results. In this work, based on the insights of our previous work [2], we fully explore the physical interplay between broadening and decoherence, by generalising previous studies of medium-modifications of the antenna spectrum [1] - so far restricted to the case where transverse motion is neglected. The result allow us to identify two quantities controlling the decoherence of a medium modified shower that can be used as building blocks for a successful future generation of Jet quenching Monte Carlos: a generalisation of the  $\Delta_{med}$  parameter of the works of [1] - that controls the interplay between the transverse scale of the hard probe and the transverse scale of the medium - and of the  $\Delta_{coh}$  in [2] - that dictates the interferences between two emitters as a function of the transverse momentum broadening acquired by multiple scatterings with the medium.

[1] L. Apolinário, N. Armesto, J. G. Milhano, and C. Salgado, JHEP 1502 (2015) 119

[2] Y. Mehtar-Tani, C. A. Salgado and K. Tywoniuk, Phys.Rev.Lett. 106 (2011) 122002 Y. Mehtar-Tani, C. A. Salgado and K. Tywoniuk, JHEP 1210 (2012) 197 J. Casalderrey-Solana and E. Iancu, JHEP 1108 (2011) 015

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