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## Novel coherence effects in initial state medium induced gluon radiation

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Radiative interferences in the multiparton shower is the building block of QCD jet physics in vacuum. The presence of a QCD medium is expected to alter this interference pattern. We investigate color coherence effects in the medium modification to the initial state radiation in a simple setup which allows to include these effects in a clean way. We derive the medium induced gluon spectrum of an “asymptotic” parton which suffers a hard scattering and subsequently crosses a QCD medium. The angular distribution of the induced gluon spectrum gets modified when one includes interference terms between the incoming and the outgoing parton at finite angle. In the soft limit, we provide a simple and intuitive probabilistic picture which could be of interest for Monte Carlo implementations. We comment on the possible phenomenological consequences of this new mechanism of soft gluon radiation in nuclear collisions.

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