

## Monte Carlo implementation of medium-induced colour coherence in parton branching

Jets are known to be strongly modified when propagating through a hot and dense medium. Current LHC and RHIC results in heavy-ion systems show a strong suppression of the total jet yield, increase of dijet and boson-jet momentum imbalance and modification of the jet substructure. The description of the later is challenging for all event Monte Carlo event generators that describe jet modifications based on a pQCD description of single medium-induced gluon radiation [1]. Nonetheless, all these models lack the existence of interplay between coherence and decoherence phenomena that occur to a QCD antenna when propagating through the QGP, an effect that is known to qualitatively describe all intra-jet observables so far [2]. In this talk, we present the first pQCD based Monte Carlo event generator that implements such in-medium modifications of the coherence pattern of a parton shower. Our results will allow to more accurately separate the effect of medium response [3] to the propagation of a fast particle from those of the medium modification of parton branching, on a reconstructed jet.

[1] Armesto, Cunqueiro and Salgado, arXiv:0907.1014;  
Zapp, arXiv:1311.0048;  
Schenke, Gale, Jeon, arXiv:0909.2037.

[2] Casalderrey-Solana, Mehtar-Tani, Salgado, Tywoniuk, arXiv:1210.7765;  
Mehtar-Tani, Tywoniuk, arXiv:1401.8293.

[3] Elayavalli, Zapp, arXiv:1707.01539;  
Park, Singh, Jeon, Gale, presentation at QM18.

### Summary

**Primary authors:** APOLINARIO, Liliana (LIP (PT)); ARMESTO PEREZ, Nestor (Universidade de Santiago de Compostela (ES)); CUNQUEIRO MENDEZ, Leticia (Oak Ridge National Laboratory - (US))

**Presenter:** CUNQUEIRO MENDEZ, Leticia (Oak Ridge National Laboratory - (US))

**Session Classification:** Parallel 2