



Contribution ID: 666

Type: Parallel talk

Time evolution of a medium-modified jet

Thursday 11 July 2019 09:56 (18 minutes)

The presence of a hot and dense medium, produced in ultra-relativistic heavy-ion collisions, is known to modify the parton shower evolution. Several observations of the resulting intra-jet activity show significant modifications of what can be considered as a medium-modified jet from a “vacuum”(proton-proton) reference. These modifications, generically known as jet quenching effects, are the result of the multiple interactions of the parton shower with the produced fast evolving quark-gluon plasma (QGP). Recent efforts have tried to assess the time dependence of jet quenching effects, with particular focus on late [1] or early dynamics [2]. In this talk, we show a novel tool that evaluates the full-time evolution of the jet, by applying jet grooming techniques to a fully re-clustered jet. The result can bring novel insights into the QGP expansion as well as shed some light on how to re-sum, in a consistent way, vacuum-like and medium-like emissions into a single parton shower evolution equation.

[1] L. Apolinário, G. Milhano, C. Salgado, G. Salam, arXiv:1711.03105

[2] C. Andrés, N. Armesto, H. Niemi, R. Paatelainen, C. Salgado, arXiv:1902.03231

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Session Classification: Heavy Ion Physics

Track Classification: Heavy Ion Physics