



Contribution ID: 24

Type: **Talk**

Dynamically groomed jet radius in heavy-ion collisions

Monday 1 August 2022 11:00 (25 minutes)

Jet substructure is a powerful tool to probe the perturbative regime of jet evolution in proton-proton and heavy-ion collisions. Over the past few years, a wide variety of substructure observables have been proposed in order to understand specific aspects of jet dynamics in a quark-gluon plasma (QGP).

In this talk, based on [1,2], we will explore the ability of such an observable, called Dynamical Grooming [3], to pin down the properties of the QGP. In particular, we will present the computation via analytic resummation techniques and Monte-Carlo simulations, of the opening angle θ_g of the hardest splitting in the jet as defined by Dynamical Grooming. This calculation, grounded in perturbative QCD, accounts for the factorization in time between vacuum-like and medium-induced processes in the double logarithmic approximation.

Our main result is that the dominating scale in the θ_g -distribution is the decoherence angle θ_c which characterizes the resolution power of the medium to propagating color probes, which makes this observable particularly interesting to measure experimentally. To that aim, we will highlight a suitable combination of the Dynamical Grooming condition and the jet radius that leads to a pQCD dominated observable with a very small sensitivity to medium response.

Refs:

- [1] P. Caucal, A. Soto-Ontoso and A. Takacs, JHEP07(2021)020
- [2] P. Caucal, A. Soto-Ontoso and A. Takacs, arXiv:2111.14768
- [3] Y. Mehtar-Tani, A. Soto-Ontoso and K. Tywoniuk, Phys.Rev.D101,034004(2020)

Preferred track

Jets & QCD at High Scales

Subfield

Heavy-ion theory

Attending in-person?

Yes

On behalf of collaboration?

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Session Classification: Jets and QCD 1

Track Classification: Jets and QCD at high scales