



Contribution ID: 792

Type: Poster

## Computationally efficient description of QGP medium response jet-by-jet

*Wednesday, 6 April 2022 18:54 (4 minutes)*

The injection of energy and momentum from a jet into the QGP generates a wake, which leads to soft and semi-hard particle creation correlated with the jet direction after the QGP hadronizes. As several jet quenching studies have shown, this medium response phenomenon plays a crucial role in our understanding of many jet structure and substructure observables. Nevertheless, a detailed account of the phenomenological consequences of those wakes is still lacking, partly because of the computational complexity of current techniques used to describe their properties. In this work we present a computationally efficient description of the event-by-event, jet-by-jet, determination of the properties of the hadrons coming from QGP wakes. By making use of a single set of universal solutions obtained within linearized hydrodynamics on top of a Bjorken flow, and performing the adequate set of scalings, translations, rotations and boosts, we are able to match the results obtained (with much greater computational cost) using 3+1D hydrodynamics. The transparency and simplicity of our approach allows us to identify the key variables affecting the shape of the measurable hadron distributions, such as the evolution time of the wakes between its formation and freeze-out and the local QGP flow velocity, both its magnitude and its direction relative to that of the wake, at the location on the freeze-out surface where the wake freezes out. With this knowledge, we will discuss how to design observables that can measure these effects experimentally.

**Primary authors:** CASALDERREY SOLANA, Jorge (University of Barcelona); MILHANO, Guilherme (LIP-Lisbon & CERN TH); Dr PABLOS, Daniel (INFN, Turin); RAJAGOPAL, Krishna (Massachusetts Inst. of Technology (US)); Dr YAO, Xiaojun (Massachusetts Institute of Technology)

**Presenter:** Dr YAO, Xiaojun (Massachusetts Institute of Technology)

**Session Classification:** Poster Session 2 T04\_1

**Track Classification:** Jets, high-pT hadrons, and medium response