

Quark Matter 2019 - the XXVIIIth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions



Contribution ID: 655

Type: **Poster Presentation**

First results from hybrid hadronization in small and large systems

Monday 4 November 2019 17:40 (20 minutes)

“Hybrid Hadronization” is a new Monte Carlo package to hadronize systems of partons. It smoothly combines quark recombination applicable when distances between partons in phase space are small, and string fragmentation appropriate for dilute parton systems, following the picture outlined by Han et al. [PRC 93, 045207 (2016)]. Hybrid Hadronization integrates with PYTHIA 8 and can be applied to a variety of systems from $e^+ + e^-$ to A+A collisions. It takes systems of partons and their color flow information, for example from a Monte Carlo parton shower generator, as input. In addition, if for A+A collisions a thermal background medium is provided, the package allows to sample thermal partons that contribute to hadronization. Hybrid Hadronization is available for use as a standalone code and is also part of the JETSCAPE 2.0 release.

In this presentation we review the physics concepts underlying Hybrid Hadronization and how users can use the code with parton shower Monte Carlos. We demonstrate how Hybrid Hadronization affects multiplicities, hadron chemistry, fragmentation functions and jet shapes in $e^+ + e^-$, p+p and A+A collisions when combined with different parton shower Monte Carlos using PYTHIA 6, PYTHIA 8 and JETSCAPE/MATTER. We compare to calculations using pure Lund string fragmentation as well as to data from LEP, RHIC and LHC. In particular we demonstrate observable effects of the recombination of shower partons with thermal partons. As a benchmark we compare to pure PYTHIA 8 string fragmentation and to data.

Author: FRIES FOR JETSCAPE COLLABORATION, Rainer (Texas A&M University)

Presenter: FRIES FOR JETSCAPE COLLABORATION, Rainer (Texas A&M University)

Session Classification: Poster Session

Track Classification: Jet modifications and medium response