
Contribution ID: **7** Type: **not specified**

# Jet substructure studies for Relativistic Heavy Ion Collider with the sPHENIX detector

With the newly upgraded sPHENIX detector capable of performing high precision jet substructure measurements, we present a comprehensive and systematic jet substructure study at Relativistic Heavy Ion Collider. The study includes a variety of key jet substructure variables such as jet angularities with and without soft-drop or collinear-drop grooming, as well as recoil-free di-jet and photon+jet azimuthal angle decorrelation using the Winner-Take-All (WTA) recombination scheme to define the jet directions. We employ various event generators in the study, including Pythia, Herwig and Sherpa for the proton-proton collision baseline. The Caeser framework is used to perform semi-numerical calculations for these observables. With the well-defined perturbative precision, non-perturbative contributions can be robustly extracted. For the medium jet substructure study, we investigate different Monte Carlo implementations of quenching models such as JETSCAPE, Jewel and QPythia. The jet observables have different sensitivities to physics ranging from parton shower to soft radiation, allowing us to quantify model differences and thereby point to modification patters through which future experimental data may shed light on the nature of jet-medium interaction.

**Primary authors:** FEDKEVYCH, Oleh (Georgia State University); CHIEN, Yang-Ting (Georgia State University)

**Presenter:** FEDKEVYCH, Oleh (Georgia State University)