



Contribution ID: 560

Type: Poster

## Photon-Jet correlations in central heavy-ion collisions with JETSCAPE

*Wednesday, 6 April 2022 18:42 (4 minutes)*

We present a comparison of observables related to photon-triggered jets for different collision energy systems, at LHC and RHIC energies, with the latest update of the JETSCAPE framework [1,2]. In heavy-ion collisions, multiple probes are used to study the properties of the Quark-Gluon Plasma (QGP). Photons can be produced at any stage of the heavy-ion collision. Since photons do not interact with the medium constituents, prompt photons that are produced early, directly in the hard sub-processes, can be used to differentially study the modification of the recoiling jet. In this work, we study photon-triggered jets through charged jet yields, momentum fraction correlations ( $x_J$ ), and angular ( $\Delta\phi$ ) correlations, using the JETSCAPE framework. We extend our previous work of ( $x_J$ ) and ( $\Delta\phi$ ) [3] with new high statistics runs, using the latest version of the multi-stage JETSCAPE framework. We use the corresponding isolation cut on the final state to identify the prompt-photons, to get a reasonable comparison with the experimental data. The same set of parameters tuned for single inclusive jet and leading hadron analysis, with a new virtuality dependent transport coefficient  $\hat{q}$ , are used in this calculation as well, with no refitting. For the first time, the study is done simultaneously for both RHIC and LHC energies. The comparison with experimental data for different collision systems and energies provides a wide-ranging, parameter-free, and independent verification of the multistage approach in heavy-ion collisions.

1. Putschke, J. H., et al. "The JETSCAPE framework." arXiv preprint arXiv:1903.07706 (2019).
2. Cao, Shanshan, et al. "Multistage Monte Carlo simulation of jet modification in a static medium." *Physical Review C* 96.2 (2017): 024909.
3. Sirimanna, C. (2021). Photon-jet correlations in p-p and Pb-Pb collisions using the JETSCAPE framework. *PoS, HardProbes2020*, 051. <https://doi.org/10.22323/1.387.0051>

**Primary author:** NATTRASS, Christine (University of Tennessee (US))**Presenter:** SIRIMANNA, Chathuranga (Wayne State University)**Session Classification:** Poster Session 2 T13**Track Classification:** Electroweak probes