

# Santa Fe Jets and Heavy Flavor Workshop

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## The need for surface bias studies for correlation analyses

*Tuesday, January 12, 2016 12:00 PM (30 minutes)*

High momentum particle correlations, such as di-hadron, direct photon-hadron and jet-hadron correlations, have provided valuable insight into the properties of the Quark Gluon Plasma. High momentum hadrons as triggers are biased to have originated near the surface of the created medium. Direct photons can originate from anywhere within the medium. Fully reconstructed jets as a trigger can be tuned based on the parameters of the jet finding algorithm to originate from various pathlengths. However, complete understanding of how these parameters influence the pathlength must be explored through theoretical models and calculations. The comparison between these three types of correlations probe the pathlength dependence to the energy loss and comparison between the same correlations measured at RHIC and LHC will reveals the  $q$ -hat dependence of temperature. Experimental results to date have been limited by statistical precision and systematic uncertainties. However, with the start of Run 2 at the LHC underway and the future detector, sPHENIX, planned at RHIC, detailed comparison between different correlation measurements and from LHC and RHIC will be able to put strong constraints on models. While, surface biases studies have been done within the framework of some models, such as YaJEM and JEWEL, more theoretical models and analytical calculations should explore these features to shape our understanding of how these biases influence the observed quantities. This talk will review current experimental correlation results relevant to jets, anticipated results and the importance of understanding the biases with the guidance of theory to fully test models and develop a complete understanding of partonic energy loss in the QGP.

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