

# Santa Fe Jets and Heavy Flavor Workshop

January 11-13, 2016

Contribution ID: 75

Type: **not specified**

## Hadronic matrix elements in (1+2)-dimensions: recent developments

Hadronic matrix elements with longitudinal and transverse dependence play an important role in a wide variety of QCD related phenomena. Among other things, such quantities are required to address certain issues in hadronic spin physics, to make predictions for the transverse momentum dependent spectrum of the Higgs boson production at the LHC, to obtain three-dimensional hadronic tomography and for jet broadening (and other observables) of jets traversing a hot and dense medium. In my talk I will review the main subtle issues regarding transverse momentum dependent (TMD) functions, how they are resolved and certain properties obtained for the newly defined TMD functions. Especially I will consider generalized TMDs, TMD parton distribution functions and the jet quenching parameter  $\hat{q}$ . Time allows, I will discuss some of the intriguing remaining open questions that span most of the topics mentioned above.

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