

# Santa Fe Jets and Heavy Flavor Workshop

January 11-13, 2016

Contribution ID: 77

Type: **not specified**

## B and J/psi mesons in jets using SCET

*Wednesday, January 13, 2016 10:00 AM (30 minutes)*

We use the framework of Soft-Collinear Effective Theory (SCET) to study the production of B and J/psi mesons in jets. We focus on jets where the angularity, a class of jet-shape variable, of one of the jets is measured. Using factorization formulae provided by SCET, we calculate the next-to-leading-log-prime (NLL') resummed cross-section for  $e^+e^- \rightarrow 2$  jets where one of the jets contains a B meson and  $e^+e^- \rightarrow 3$  jets where a gluon jet contains a J/psi. We express our analytic cross-sections in terms of fragmenting jet functions (FJF), which give the probability that an identified hadron in a jet carries a fraction  $z$  of the energy of a jet with measured angularity  $\tau_a$ . FJF's can in turn be written as convolutions of renormalization-group-evolved fragmentation functions (FF) and perturbatively calculable matching coefficients. We calculate these matching coefficients to next-to-leading-order (NLO) accuracy for the jets where angularity is measured. We compare our analytic distributions for  $z$  and  $\tau_a$  with predictions from the Pythia and Herwig Monte Carlo event generators. For B meson production we find consistency between analytic and Monte Carlo results. For J/psi production, we discuss how the Monte Carlo must be modified in order to properly treat the fragmentation of  $g \rightarrow J/\psi$  in 3 jet events

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**Session Classification:** Session 9