Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Studies of Transverse Momentum Dependent Parton Distributions and Bessel Weighting[1] LEONARD GAMBERG, Pennsylvania State Univ — We present a new technique for analysis of transverse momentum dependent parton distribution functions, based on the Bessel weighting formalism. Advantages of employing Bessel weighting are that transverse momentum weighted asymmetries provide a means to disentangle the convolutions in the cross section in a model independent way. The resulting compact expressions immediately connect to work on evolution equations for transverse momentum dependent parton distribution and fragmentation functions. As a test case, we apply the procedure to studies of the double longitudinal spin asymmetry in SIDIS using a dedicated Monte Carlo generator which includes quark intrinsic transverse momentum within the generalized parton model. Using a fully differential cross section for the process, the effect of four momentum conservation is analyzed using various input models for transverse momentum distributions and fragmentation functions. We observe a few percent systematic offset of the Bessel-weighted asymmetry obtained from Monte Carlo extraction compared to input model calculations. Bessel weighting provides a powerful and reliable tool to study the Fourier transform of TMDs with controlled systematics due to experimental acceptances and resolutions with different TMD model inputs.

[1]Work is supported by the U.S. Department of Energy under Contract No. DE-FG02-07ER41460

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Date submitted: 30 Jun 2015 Electronic form version 1.4