

Abstract Submitted  
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**Extraction of the Boer-Mulders Function from Unpolarized SIDIS Data** BENJAMIN GORDON, Lebanon Valley Coll, ANDREAS METZ, Temple University, DANIEL PITONYAK, Lebanon Valley Coll, ALEXEI PROKUDIN, Penn State Berks, ADAM RILATT, Lebanon Valley Coll — One avenue to study the 3D momentum-space tomography of hadrons is through high-energy electron-nucleon semi-inclusive deep-inelastic scattering (SIDIS) collisions, which are sensitive to parton intrinsic transverse momentum  $kT$ . One finds that even in unpolarized SIDIS collisions, angular modulations, such as  $\cos(2\phi)$ , occur in the cross section. The  $\cos(2\phi)$  dependence comes from two sources: a correlation between parton transverse spin and  $kT$ , encoded in the twist-2 Boer-Mulders transverse momentum dependent (TMD) function that couples to the Collins TMD function; and a higher-twist (twist-4) so-called Cahn effect involving unpolarized TMD functions. In this work we study SIDIS data from HERMES, COMPASS, and CLAS in order to extract the Boer-Mulders function, considering also the contribution from the Cahn effect. We include not only  $\cos(2\phi)$  asymmetry data, but also HERMES and COMPASS multiplicity data as well as electron-positron annihilation data from BELLE, BaBar, and BESIII simultaneously in our analysis.

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