

Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

TDA measurements based on hard exclusive pion electroproduction with CLAS at JLAB¹ STEFAN DIEHL, Justus Liebig University Giessen and University of Connecticut, CLAS COLLABORATION — Many experiments showed the QCD factorisation mechanism in the "nearly forward region" (large Q and small $|t|$) can be divided into a hard part, described by perturbative QCD (pQCD) and in two general structure functions, the GPDs for the nucleon and the pion distribution amplitudes (DAs). The recent measurement from CLAS in the "nearly backward" kinematic region (large Q and small $|u|$) provided the potentially applicable collinear factorized description in terms of a convolution of the non-perturbative nucleon to-pion transitions (TDAs), the nucleon DAs and the hard interaction amplitude from pQCD. For the first time, we have measured single beam spin asymmetries to extract $A_{LU}^{\sin(\phi)}$ moments from the hard exclusive π^+ channel off the unpolarized hydrogen target in a wide range of kinematics from forward to backward angles in CM frame. The measured moment in forward angles is known to be sensitive to generalized parton distributions (GPDs), while in backward angles, it is known to be sensitive to transition distribution amplitudes (TDAs). Our results clearly show that the sign of forward beam spin asymmetry measurements is positive whereas that of backward BSA measurements is negative, with the sign transition taking place around 90° . By performing accurate measurements over a wide range of Q , x_B and $-t$, we can explore the transition from hadronic to partonic reaction mechanisms. As an Outlook, first results on the exclusive pion electroproduction with CLAS12 will be presented.

¹The work is supported by DOE grant no: DE-FG02-04ER41309.

Stefan Diehl
Justus Liebig University Giessen and University of Connecticut

Date submitted: 11 Jul 2019

Electronic form version 1.4