Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

The Constituent Counting Rule and Omega Photoproduction[1] TREVOR REED, CHRISTOPHER LEON, FRANK VERA, LEI GUO, BRIAN RAUE, Florida International University — The constituent counting ruling (CCR) has been found to hold for numerous hard, exclusive processes. It predicts the differential cross section at high energies and fixed $\cos\theta_{c.m.}$ should follow $\frac{d\sigma}{dt} \sim \frac{1}{s^{n-2}}$, where n is the minimal number of constituents involved in the reaction. An in-depth examination of applying the CCR to the reaction $\gamma p \to \omega p$ at $\theta_{c.m.} \sim 90^\circ$ is provided. CLAS data with an energy range of $s = 5-8$ GeV^2, where the CCR has been shown to work in other reactions, is used in this analysis. The data selected to test the CCR is done so on the basis of momentum transfer, the Mandelstam variable t. A Taylor-series expansion of the fitting function is implemented to take advantage of data from nearby angle bins in the analysis. Naïvely, this reaction would have $n = 9$ (or $n = 10$ if the photon is in a $q\bar{q}$ state) and scaling of $\sim s^{-7}$ (s^{-8}) is expected. Instead, a scaling of $s^{-(9.08\pm0.11)}$ was observed.

[1]U.S. Department of Energy, Office of Nuclear Physics, No. DE-SC0013620 and DE-FG02-01ER41172

Trevor Reed
Florida International University

Date submitted: 26 Jun 2020 Electronic form version 1.4