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Measurement of beam-polarized Deeply Virtual Compton Scattering observables with $e\gamma$ detection @ CLAS12

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In the context of nucleon structure studies, Generalized Parton Distributions (GPDs) are crucial for understanding the correlation between the longitudinal momentum and the transverse position of partons inside the nucleon. A privileged channel for GPDs studies is the Deeply Virtual Compton Scattering (DVCS) process whose experimental observables can provide access to GPDs through spin dependent asymmetries. Although detecting all final state particles is preferred for selecting DVCS events, DVCS identification can be ensured by requiring the detection of only two final state particles as the missing particle can be reconstructed from conservation laws. In this work, we present new Beam Spin Asymmetry and preliminary cross-section measurements of proton-DVCS in the $e\gamma$ topology from experimental data taken by the CLAS12 detector at Jefferson Lab. Besides, we show that relying on $e\gamma$ detection and Machine Learning techniques boosts statistics and gives access to a larger phase space than the proton-detected topology.

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