

Constraining DVCS Compton Form Factors Using Lattice QCD informed Neural Network

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The lattice QCD calculation of generalized form factors are exploited to determine the subtraction constants through all order dispersion relations of Deeply Virtual Compton Scattering (DVCS). The leading order relation is found to constrain significantly the real part of the Compton Form Factors (CFFs), and the higher order one reduces considerably both the real and imaginary part of CFFs in a global analysis of proton data. This is realized by a synthesis of the DVCS data and LQCD calculations within a neural network framework, whose architecture is specifically designed for a reliable extrapolation to unmeasured kinematic regime. By leveraging dispersion relations beyond leading order, our framework allows for adding higher moments of generalized parton distributions from LQCD into the extraction of CFFs from DVCS data.

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