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Di-jets the Path to the (un)polarized Partonic Photon Structure at an EIC

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In electron-proton collisions, the incoming electron is coupled directly to a parton of the proton with the exchange of a virtual photon, which has properties close to a real photon when the transfer momentum is small. In QCD, the exchanged physical photon can be approximated as a superposition of the bare photon state (direct process) and the hadronic photon state (resolved process). We discuss how the measurement of di-jets can be utilized to separate these two types of processes. Measuring di-jets in quasi-real photoproduction events, one can effectively access the underlying parton structure of the exchanged photons.

The unpolarized photon PDFs can be extracted with high precision from the di-jet cross section. It will be shown that the polarized PDFs for photons can for the first time be extracted by measuring the double spin asymmetry as function of $x_{\{\gamma\}}$. A tagging method is used to probe the flavor of the parton content experimentally. In addition, we will discuss the effects of the underlying event on these measurements.

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