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Illuminating Nucleon Gluon Interference via Calorimetric Asymmetry

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We present an innovative approach to the linearly polarized gluons confined inside the unpolarized nucleon in lepton-nucleon scattering. Our method analyzes the correlation of energy flows at azimuthal separations ϕ .

The interference of the spinning gluon with both positive and negative helicities translates into a $\cos(2\phi)$ asymmetry imprinted on the detector. Unlike the conventional transverse momentum dependent (TMD) probes, the $\cos(2\phi)$ asymmetry in this approach is preserved by rotational symmetry, holds to all orders, and is free of radiation contamination, thus expected to provide the exquisite signature of the nucleon linearly polarized gluons.

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