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Unpolarized twist-two GPD and the trace anomaly

Wednesday 29 October 2025 18:00 (25 minutes)

We present a one-loop perturbative study of unpolarized twist-two generalized parton distributions (GPDs) for external on-shell gluon states. A finite quark mass □ is kept throughout: it serves as an infrared regulator and, crucially, enables an explicit realization of the full trace-anomaly relation. By taking second Mellin moments, we extract the associated gravitational form factors (GFFs) in QED and QCD and verify the matching implied by the energy–momentum tensor operator identity, including the gluonic trace term. Particular attention is given to anomaly-induced “anomaly-pole”structures. The analysis complements our previous work on polarized twist-two GPDs and the axial anomaly, providing a unified picture of anomaly effects in partonic correlators.

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