Partonic orbital angular momentum and contributions to the trace anomaly ABHA RAJAN, Brookhaven National Laboratory — Quark gluon interactions are crucial to our understanding of partonic orbital angular momentum. Despite describing a quark quark correlation function, twist three Generalized Parton Distributions (GPDs) implicitly involve quark gluon interactions. They get contributions from leading twist GPDs, the quark mass in the axial vector case and a term involving the quark gluon quark correlation function also known as the genuine twist three term. We show how each of these contributions are derived by looking at the underlying k_T structure. We also highlight the role of the gauge link both in the collinear limit and the generalized transverse momentum limit. Several open questions remain about the mass decomposition of the proton. As the constituent quarks are very light, the quantum effects that make the theory non conformal and hence give the proton most of its mass are encompassed in the trace anomaly. The quark and gluon contributions to the total energy momentum tensor are parameterized using the gravitational form factors. We show how to precisely write the trace anomaly in terms of these quantities.

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