

# PARTICLEFACE 2021: Unraveling New Physics Workshop & Management Committee Meeting



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## Renormalization of non-singlet quark operator matrix elements for deep-inelastic scattering

*Thursday 15 July 2021 14:30 (30 minutes)*

We calculate non-singlet quark operator matrix elements of deep-inelastic scattering in the chiral limit including operators with total derivatives.

This extends previous calculations with zero-momentum transfer through the operator vertex which provides the well-known anomalous dimensions for the evolution of parton distributions, as well as calculations in off-forward kinematics exploiting conformal symmetry. Non-vanishing momentum-flow through the operator vertex leads to mixing with total derivative operators under renormalization.

In the limit of a large number of quark flavors  $n_f$ , we determine the anomalous dimension matrix to fifth order in the  $\overline{\text{MS}}$ -scheme by exploiting consistency relations for the anomalous dimension matrix which follow from the renormalization

structure of the operators, combined with a direct calculation of the relevant diagrams up to fourth order.

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