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Quark and Gluon collinear and TMD parton distributions from HERA DIS data

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We describe a new approach to solve the coupled quark and gluon evolution DGLAP evolution equations with a Monte Carlo method. We show that this method is equivalent to other methods. We apply this method to extract quark and gluon parton densities collinear and as transverse momentum dependent (TMD) distributions using the precision HERA DIS data.

The Monte Carlo method for the solution of the evolution equation allows to estimate also large x threshold resummation effects.

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