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SUSY-like relation in evolution of gluon and quark jet multiplicities

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We show the new relationship between the anomalous dimensions, resummed through next-to-next-to-leading-logarithmic order, in the Dokshitzer-Gribov-Lipatov-Altarelli-Parisi (DGLAP) evolution equations for the first Mellin moments of the quark and gluon fragmentation functions, which correspond to the average hadron multiplicities in jets initiated by quarks and gluons, respectively. This relationship strongly improves previous treatments by allowing for an exact solution of the evolution equations. So far, such relationships have only been known from supersymmetric QCD.

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