

# Quantifying the impact of collider isolated photon data on global PDF fits

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Isolated prompt photon production in proton-(anti)proton collisions proceeds mostly through quark-gluon Compton scattering [1] and has been proposed since long to directly constrain the gluon distribution in the proton. There exist 25 pT-differential measurements of isolated photon production at collider energies in the range  $\sqrt{s}=0.2-7$  TeV which are well reproduced by next-to-leading-order (NLO) perturbative QCD predictions, yet the photon data have not been included in global parton distribution functions (PDF) fits since more than 10 years. We present a quantitative study of the impact of including these data sets into global PDF fits based on the JETPHOX NLO code [2] supplemented with the NNPDF2.1 parton densities [3]. By running over hundreds of PDF replicas and using the NNPDF reweighting technique [4] we quantify the additional constraints that all these data (and coming LHC measurements) will impose on the gluon distribution of the proton.

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[2] S.Catani, M.Fontannaz, J.P.Guillet, E.Pilon, JHEP 0205(2002)028;hep-ph/0204023

[3] R.D. Ball et al. [NNPDF Coll.], Nucl.Phys.B849(2011)296; arXiv:1101.1300

[4] R.D. Ball et al. [NNPDF Coll.], Nucl.Phys.B849(2011)112; arXiv:1012.0836

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