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A precise determination of the photon PDF

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The talk will present the contents of https://arxiv.org/abs/1607.04266

Summary

It has become apparent in recent years that it is important, notably for a range of physics studies at the Large Hadron Collider, to have accurate knowledge on the distribution of photons in the proton. We show how the photon parton distribution function (PDF) can be determined in a model-independent manner, using electron-proton (ep) scattering data, in effect viewing the ep→e+X process as an electron scattering off the photon field of the proton. To this end, we consider an imaginary BSM process with a flavour changing photon-lepton vertex. We write its cross section in two ways, one in terms of proton structure functions, the other in terms of a photon distribution. Requiring their equivalence yields the photon distribution as an integral over proton structure functions. As a result of the good precision of ep data, we constrain the photon PDF at the level of 1-2% over a wide range of x values.

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