



UNIVERSITÀ DEGLI STUDI  
DI MILANO



# Photon-induced PDFs and parton-parton luminosities

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# QED PDFs : QED models for the DGLAP input and evolution

The parameterisation of the photon density (in analogy to all other partons) represents a feature of the PDF set

DGLAP evolution equations require a boundary condition (e.g. measured at low scales) for all parton densities, including the photon one; if not available, an *Ansatz* must be provided

The photon density was generated dynamically (MRST2004, NNPDF23, CT14) or satisfies the LUX-QED relation (LUX-QED\_PDF4LHC15, NNPDF31)

Up- (2/3) and down-type (-1/3) densities are sources, with different strength, of QED radiation

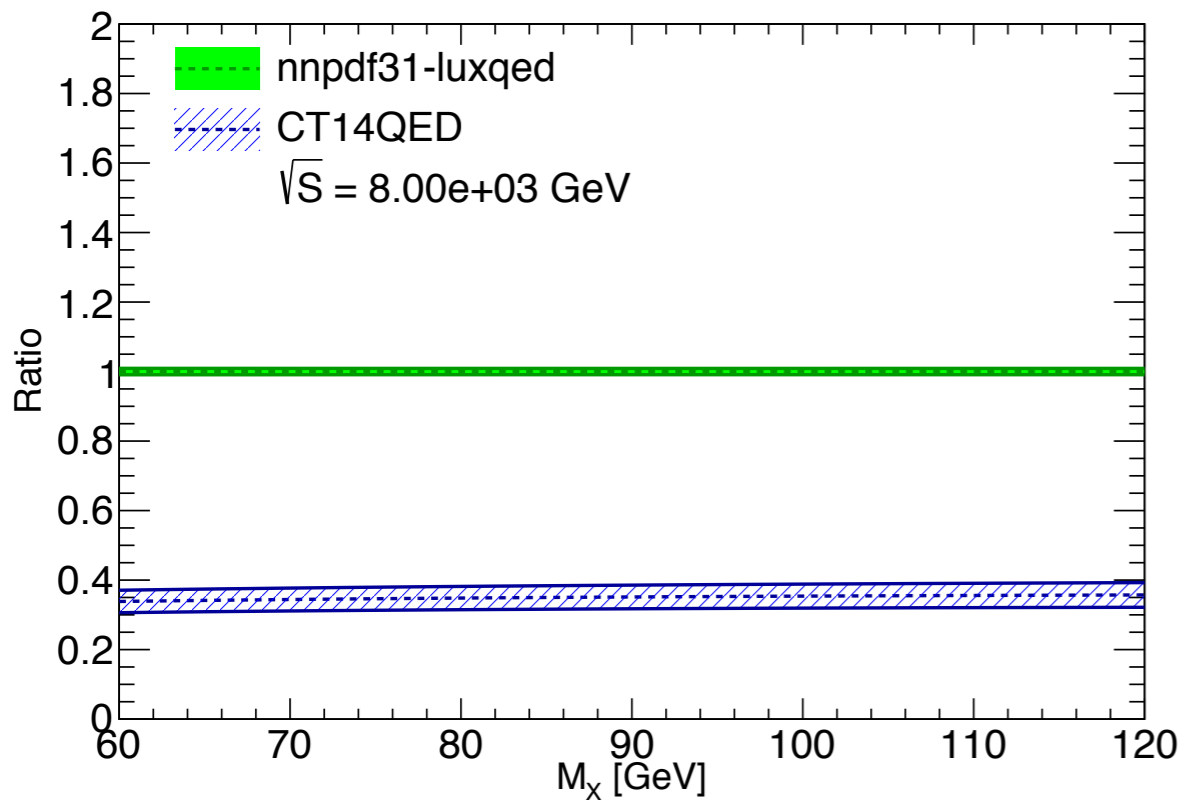
the parton-parton luminosity can be defined as

$$\mathcal{L}_{ij}(\tau) = \int_{x_{min}}^1 dx f_i(x) f_j\left(\frac{\tau}{x}\right) \quad \tau = \frac{M_{\ell\ell}}{S}$$

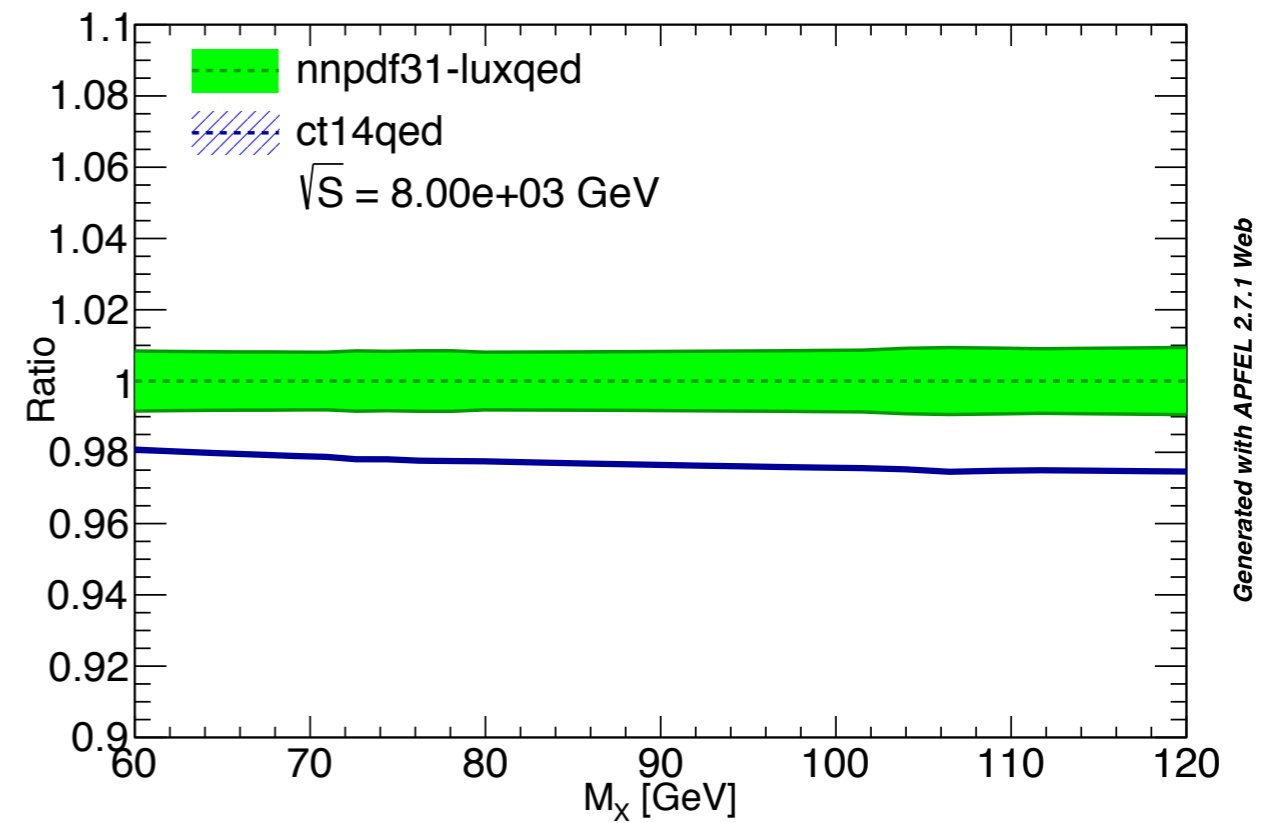
at LO the invariant mass distribution is directly proportional to the parton-parton luminosity

# QED PDFs : parton-parton luminosities

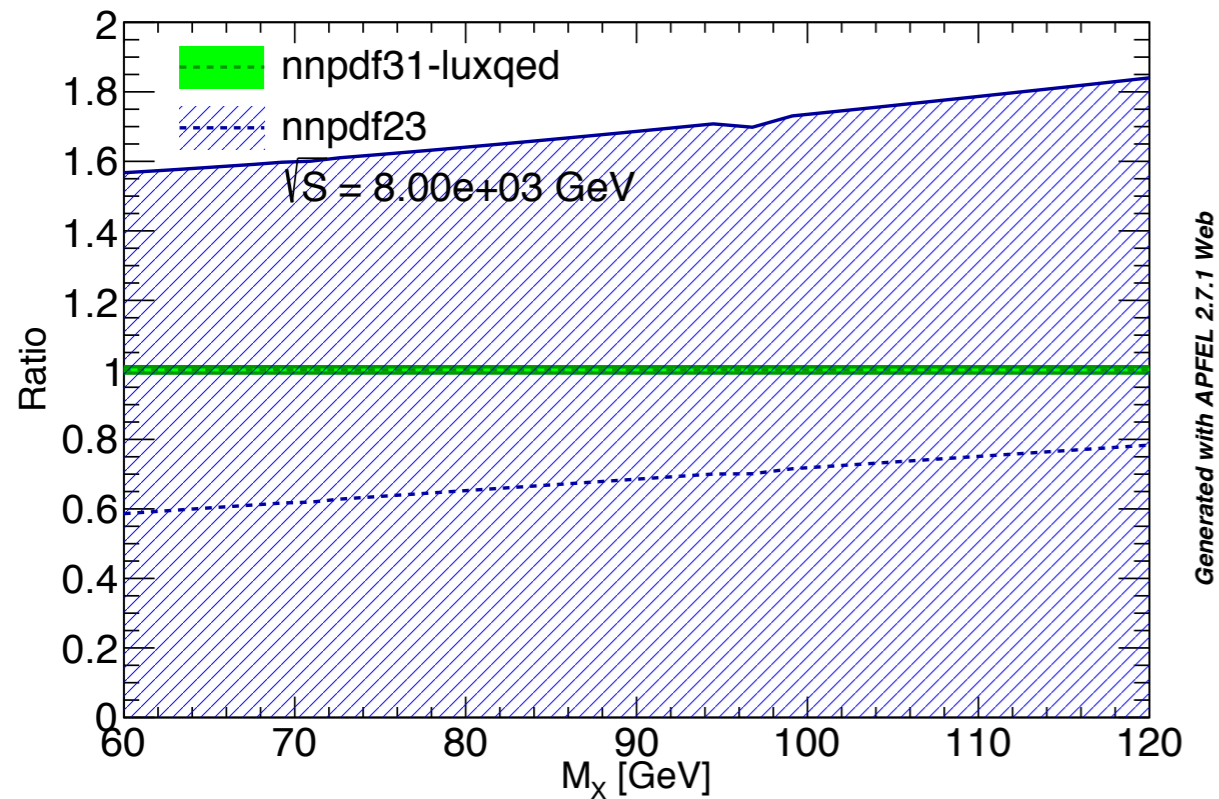
Photon-Photon, luminosity



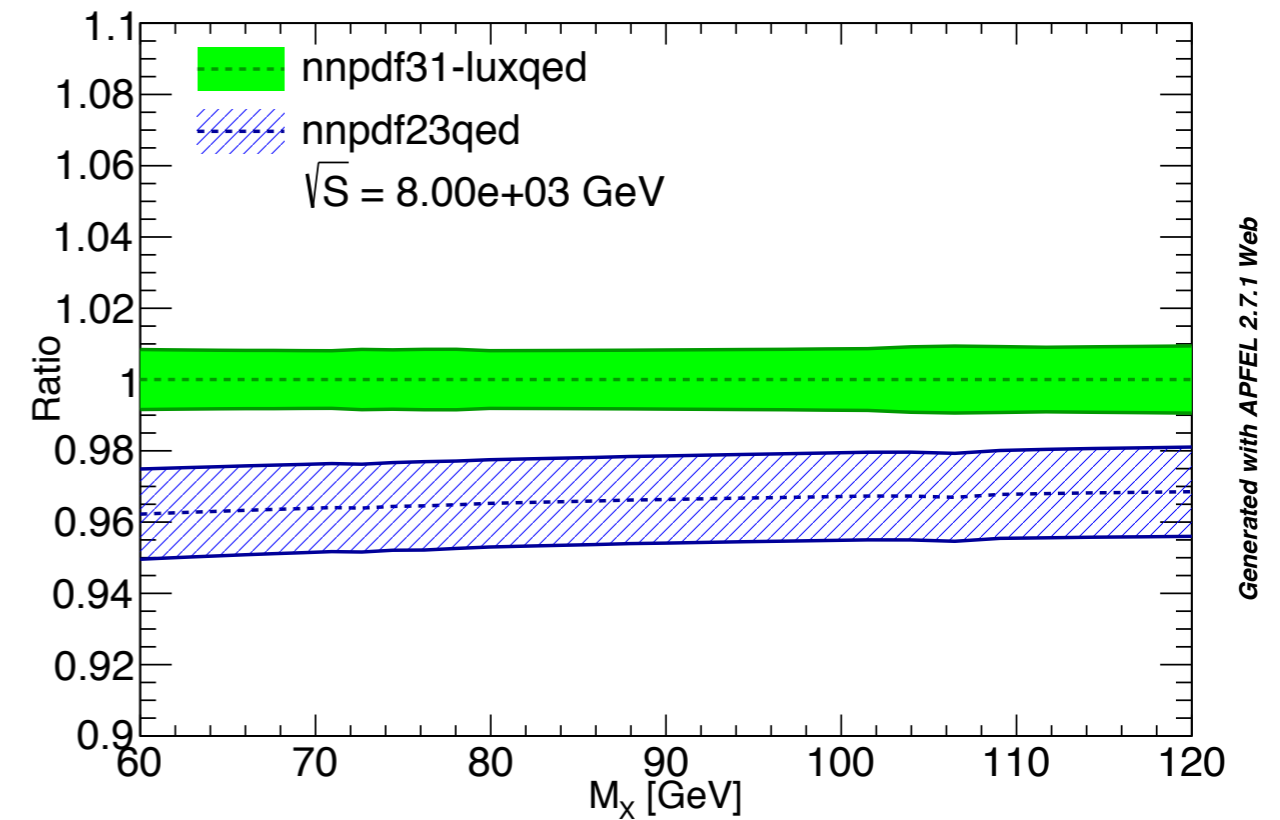
Quark-Antiquark, luminosity



Photon-Photon, luminosity

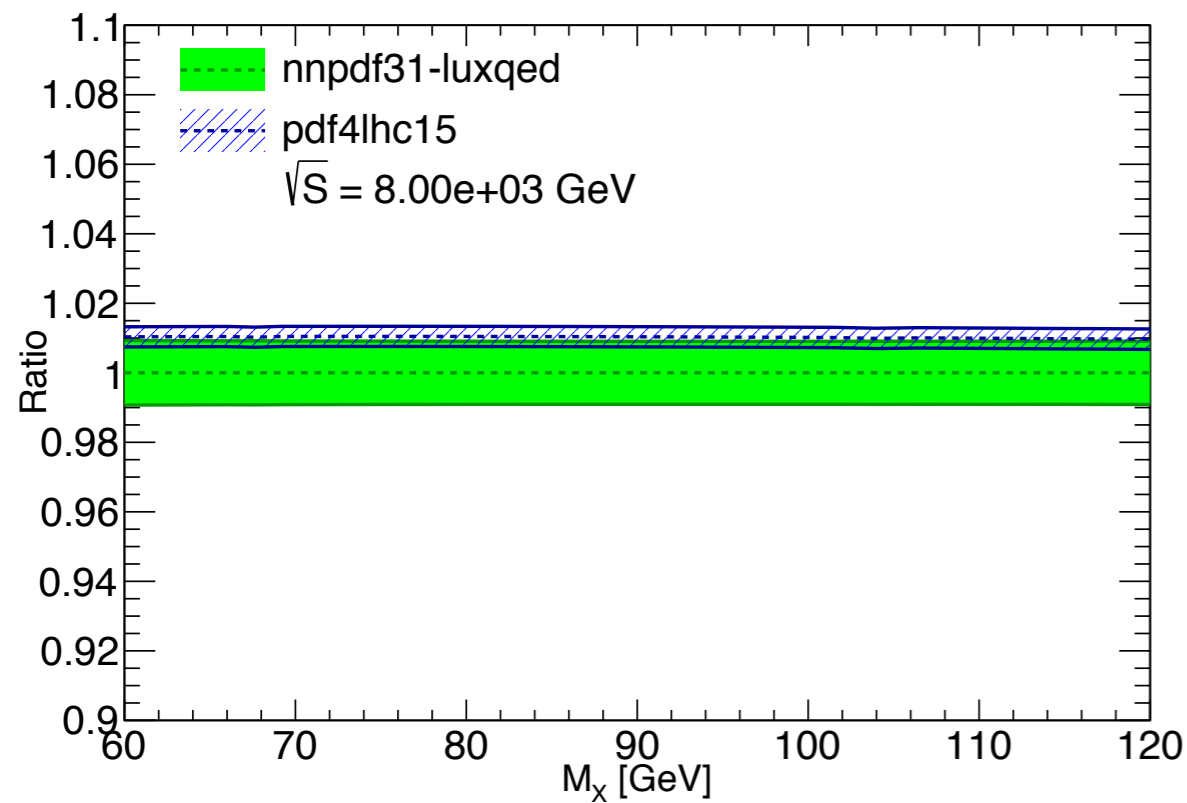


Quark-Antiquark, luminosity

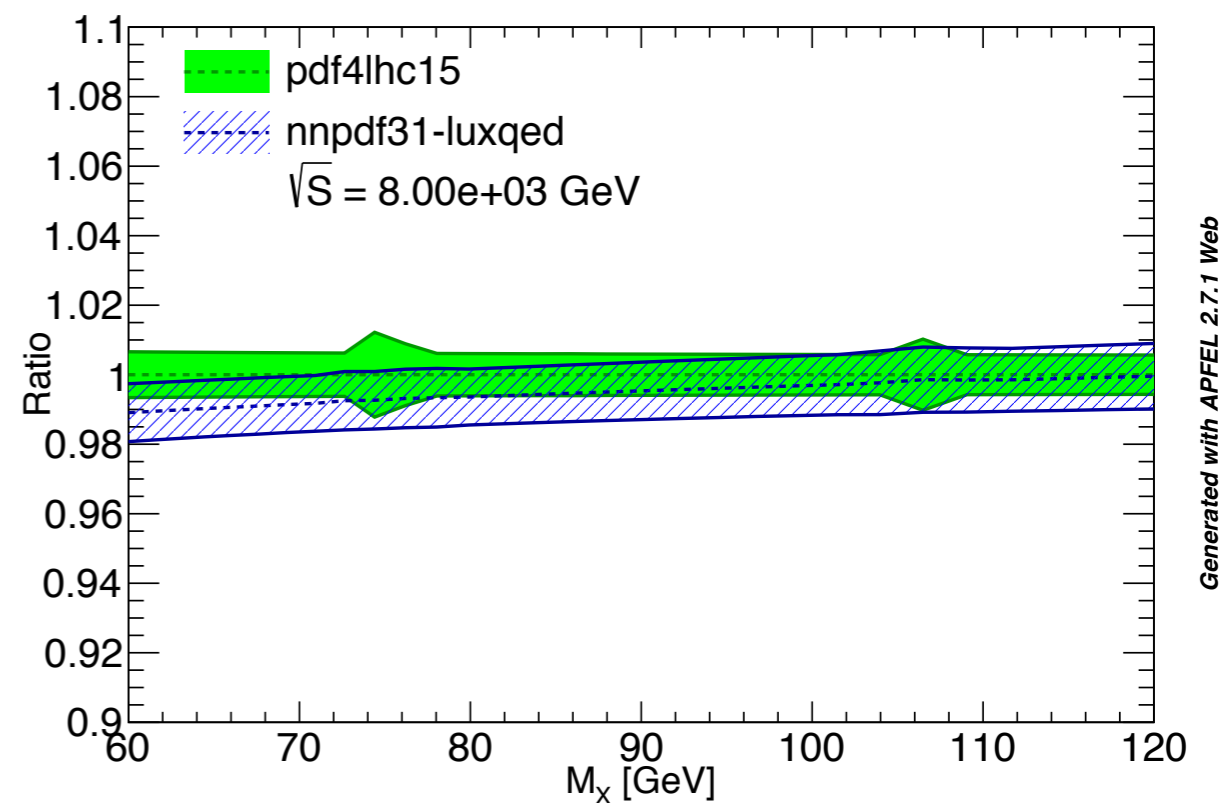


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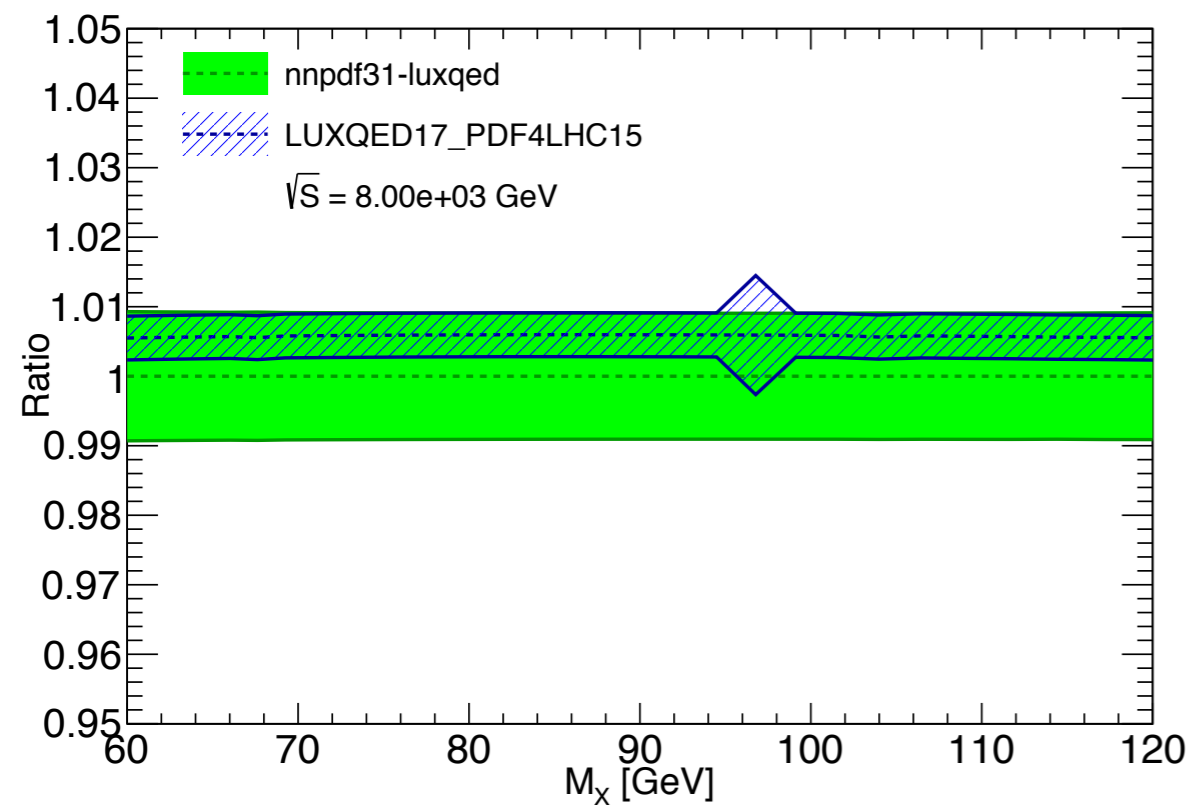
Photon-Photon, luminosity



Quark-Antiquark, luminosity



Photon-Photon, luminosity



Quark-Antiquark, luminosity

