short-distance dynamics) is computed using the colour-singlet model, where the wave function at the origin $|R(0)|^2 = 0.48\ GeV^3$ is determined from the leptonic decay width of the J/ψ: $\Gamma(J/\psi \to e^+e^-) = \frac{16\alpha^2}{9m_\psi^2}|R(0)|^2 = 4.72\ keV$.

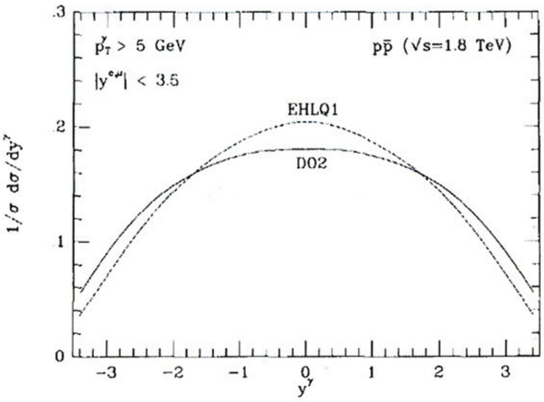

FIG. 4. Normalised differential cross section in y for $J/\psi + \gamma$) (taken from [4]).

$\bar{p}p$ collisions

The cuts applied to the data are the following: $p_T^\gamma = p_T^\psi > 5\ GeV$ for the photon and J/ψ transverse momentum and $|y^{\gamma,e,\mu}| < 3.5$ for the rapidities of the photon and the leptons. In Fig. 4 the rapidity distribution and the p_T spectrum of the photon are displayed, for two different parametrisations of the gluon content of the photon, namely the EHLQ1 [?] and D02 [?], which make different assumptions about the behaviour of the $f_{g/p}$ structure functions. Despite their different behaviour at large and small x, the two parametrisations lead to similar results for the differential cross section, as shown. Therefore, although the events produced at $\bar{p}p$ collisions might not allow to extract useful information about the normalisation of the gluon densities $f_{g/p}$, they might allow a detailed measurement of their shape at small x, down to $\sim 10^{-4}$.

ep collisions

In this case the following cuts have been applied: $p_T^{\gamma} = p_T^{\psi} > 1.5\ GeV$ and $-3.5 < y^{\gamma,e,\mu} < 3$ (negative rapidities correspond to the proton beam direction). An observation of a sizable signal, in these measurements, would be an unambiguous proof for the existence of the gluon content inside the photon. The gluon density functions of the photon and the electron are $f_{g/\gamma}$ and $f_{g/e}$ respectively. For the calculation of the latter, the gluon content of the photon $f_{g/\gamma}$ is convoluted with the photon content of the electron $f_{\gamma/e}$. However, there does not exist a momentum sum rule for $f_{g/\gamma}$, to allow to extract information on its shape and renormalisation. **Fig?** shows the normalised rapidity distribution of the photon, using three different parametrisations of the photon structure functions: DG, LAC1 and LAC3. The first one, is based on the assumption that the gluon densities inside photons come from gluon radiation off quarks, while in the analysis undertaken by the other two, the existence of an "intrinsic" gluon content of the photon is taken into account. The large differences between the three curves in **fig?** account for the lack of data constraining $f_{g/\gamma}$, pointing to the essence of more $J/\psi + \gamma$ events at HERA. It should be stated, though, that there is no guarantee that data will be described by any of these parametrisations.

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