

Unintegrated Gluon Density of Photon

Magnus Hansson

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Outline

- The Evolution
- Single-loop evolution
- CCFM evolution
- Cross sections

Unintegrated Gluon Density of Photon

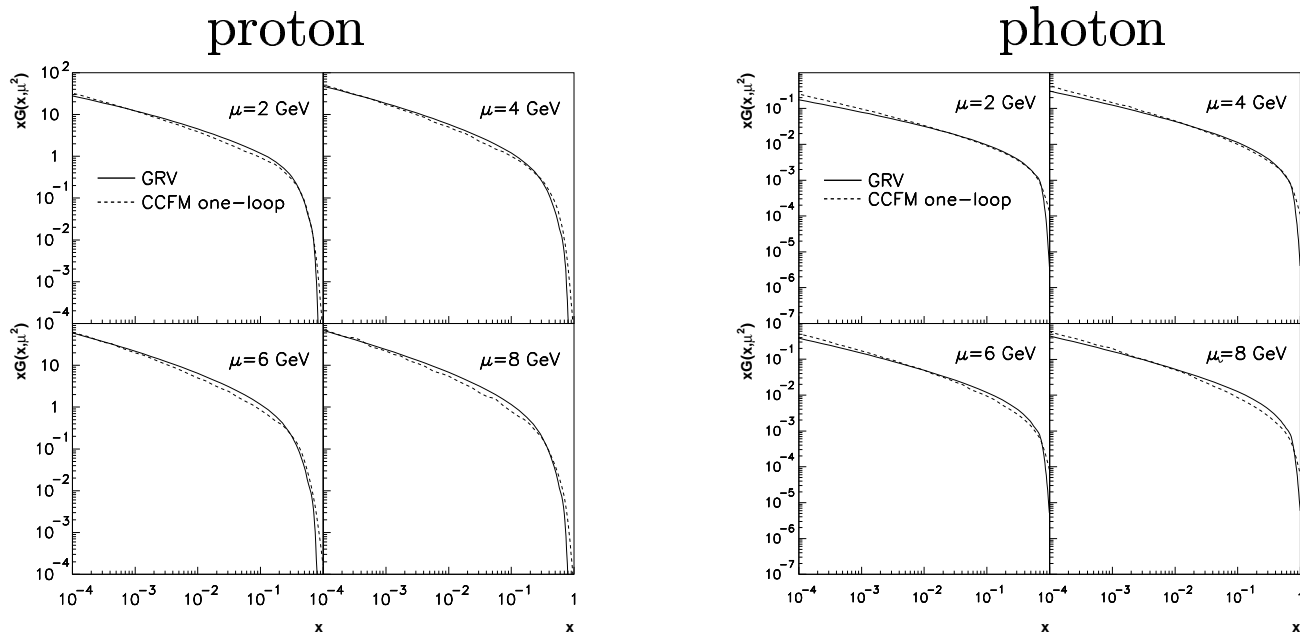
The Evolution

- Machinery: Same as proton, i.e. fwd evolution based on SMALLX (Marchesini & Webber)
- Parameters: Same as proton (js2001; from fit to F_2)
- Splitting function: $P = \left(\frac{\bar{\alpha}_s(q^2(1-z)^2)}{1-z} + \frac{\bar{\alpha}_s(k_t^2)}{z} \Delta_{ns}(z, k_t^2, q^2) \right)$

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Single loop evolution

- Input: GRV at low scale
- Single loop evolution & integrate: $xg(x, \mu^2) = \int_0^{\bar{q}^2} dk_t^2 x \mathcal{A}(x, k_t^2, \bar{q}^2)$
- Compare single-loop evolved distribution to GRV at different scales

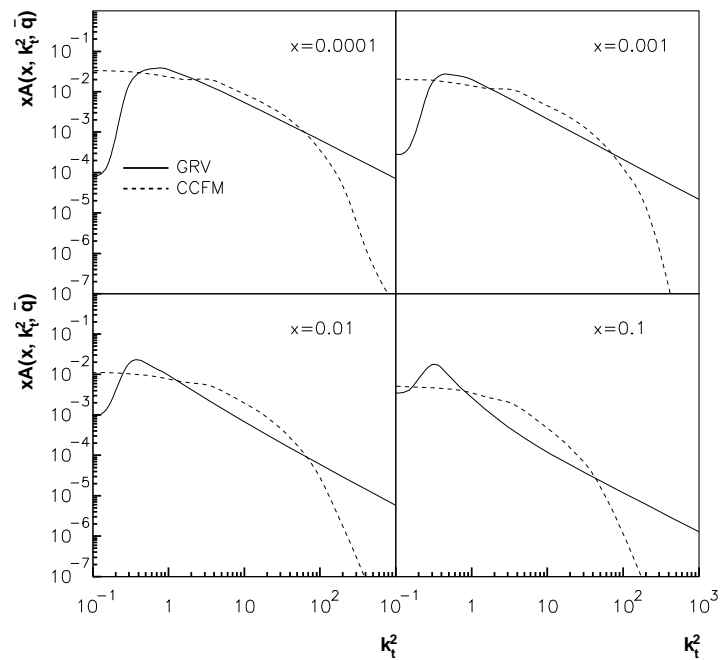
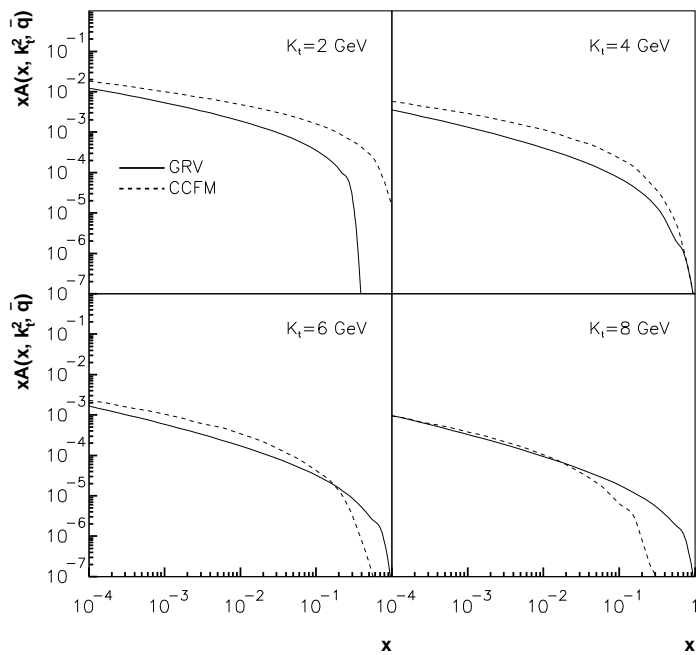


Evolution works

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CCFM evolution

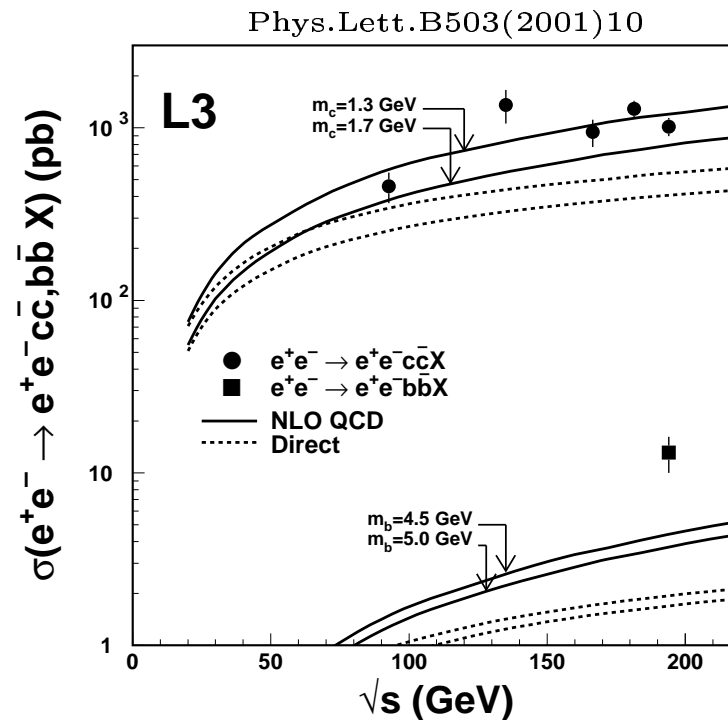
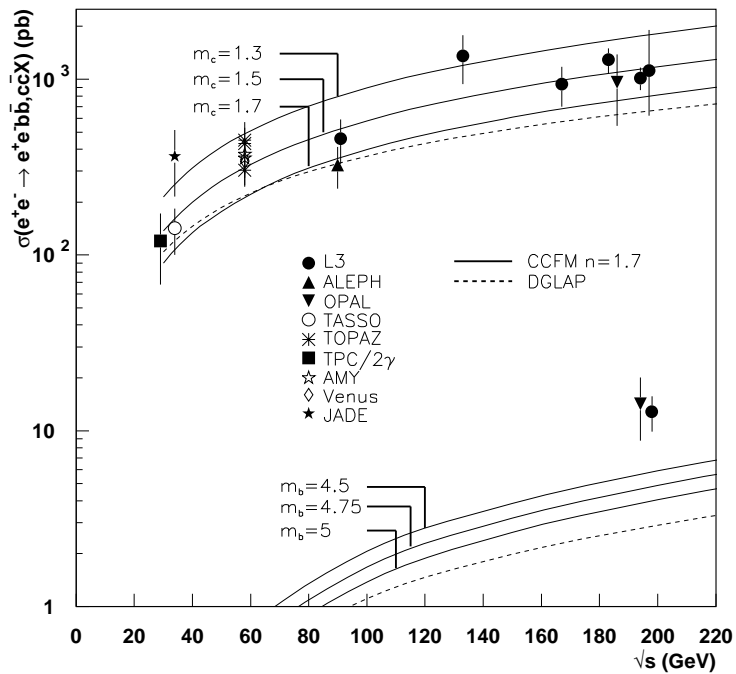
- Compare with $\mathcal{G}(x, k_t^2) \equiv \left. \frac{dg(x, \mu^2)}{d\mu^2} \right|_{\mu^2 = k_t^2}$



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Cross Sections

- $e^+e^- \rightarrow e^+e^-b\bar{b}, c\bar{c}X$
- Normalize gluon with charm cross section at $\sqrt{s} = 200 \text{ GeV}$
- Some improvement, but still too low...



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Cross Sections

- $ep \rightarrow D^* X$ (ZEUS coll. EPJC6(1999) 67)
- Gluon in photon not important here...

