Unintegrated Gluon Density of Proton

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Small-x Workshop May 8, 2004

Outline

→ Measurements

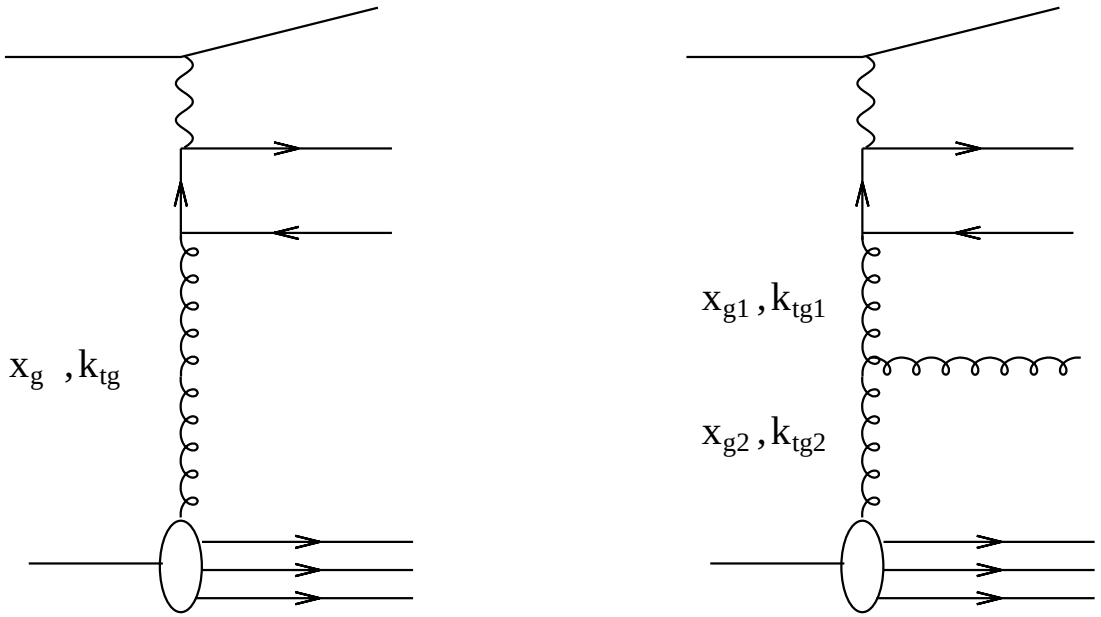
→ Global fit

→ Plan

Unintegrated Gluon Density of Proton

Measurements

- Use DIS multi-jet events
- Reconstruct x_g, k_{tg}^2 and $\bar{q} = x_g y s$
- Start with 2 jets, then 3 jets, then ...



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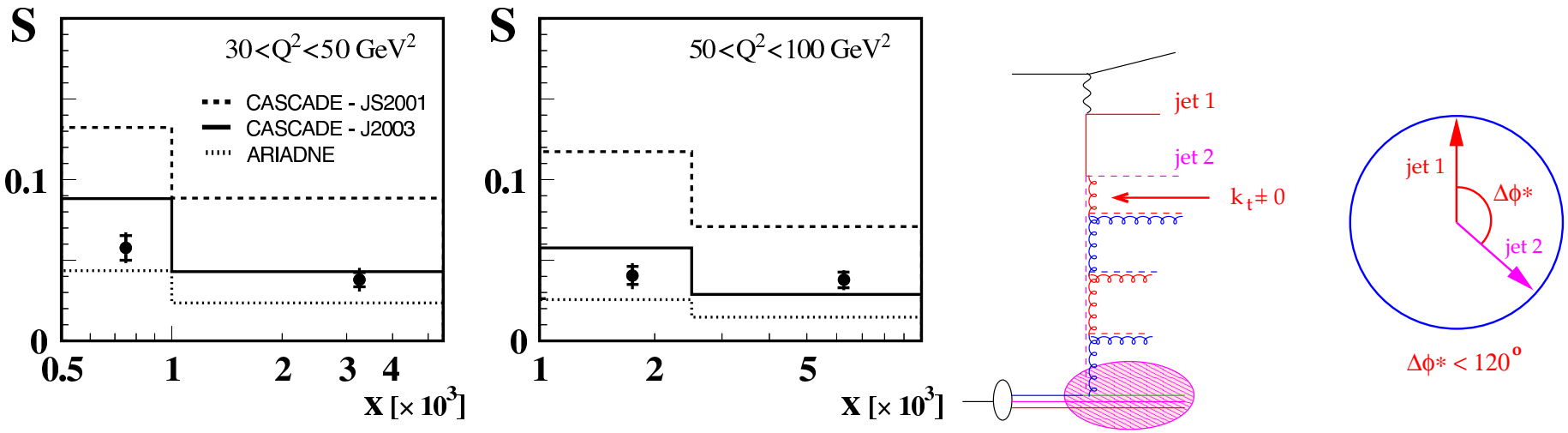
Measurements

- Measure azimuthal jet correlations with higher statistics than Eur.Phys.J.C33:477-493,2004
- $S = \frac{\int_0^{\alpha} N_{dijet}(\Delta\phi^{\star},x,Q^2)d\Delta\phi^{\star}}{\int_0^{\pi} N_{dijet}(\Delta\phi^{\star},x,Q^2)d\Delta\phi^{\star}}$



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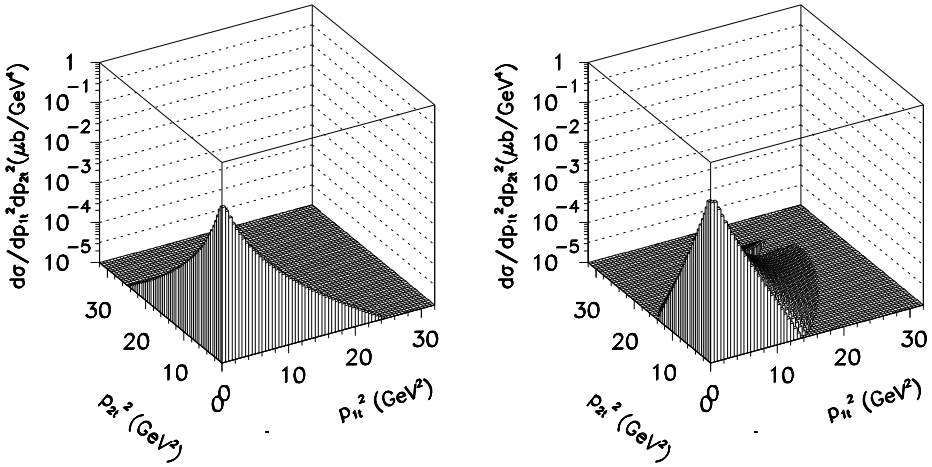
Measurements

- Measure $c\bar{c}$ correlations as proposed by M. Luszczak & A. Szczurek (hep-ph/0404210)
- Measure $\frac{d\sigma}{dp_{1,t}^2 dp_{2,t}^2}$



- Alternatively, measure $f(p_{max}^2 > kp_{min}^2; W) \equiv \frac{\sigma(p_{max}^2 > kp_{min}^2; W)}{\sigma(W)}$
  $(p_{max}^2 = max(p_{1,t}^2, p_{2,t}^2), p_{min}^2 = min(p_{1,t}^2, p_{2,t}^2))$
- Measure of spread in $p_{1,t}^2 \times p_{2,t}^2$ plane

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Global Fit

- Determine unintegrated gluon density of proton from global fits
- Previously only fitted to F_2 (j2003 set1/2/3)
- Now also use
  - $\rightarrow$ Forward jets
  - $\rightarrow$ 2+n jets
  - $\rightarrow$ Heavy quarks
  - $\rightarrow$ Azimuthal jet-jet correlations (S-distribution)

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Plan

- Investigate which processes are sensitive to what $[x, k_t^2]$ region
- Optimize cuts
- Perform global fit on all processes
- What influence has each process on each variable?