

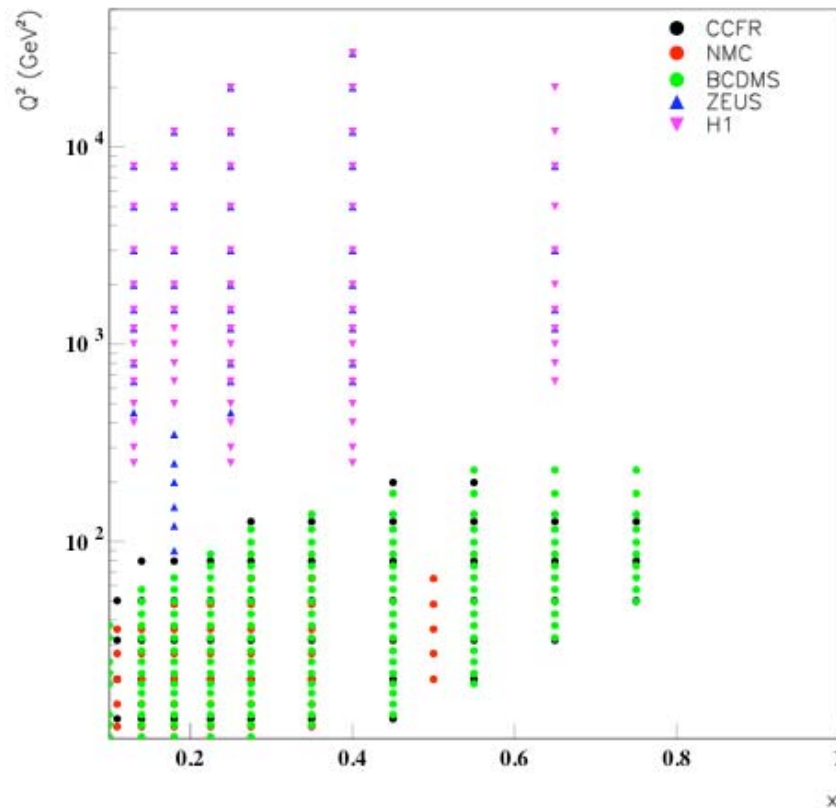
Measurement of High-x Cross Sections with ZEUS at HERA

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Motivation

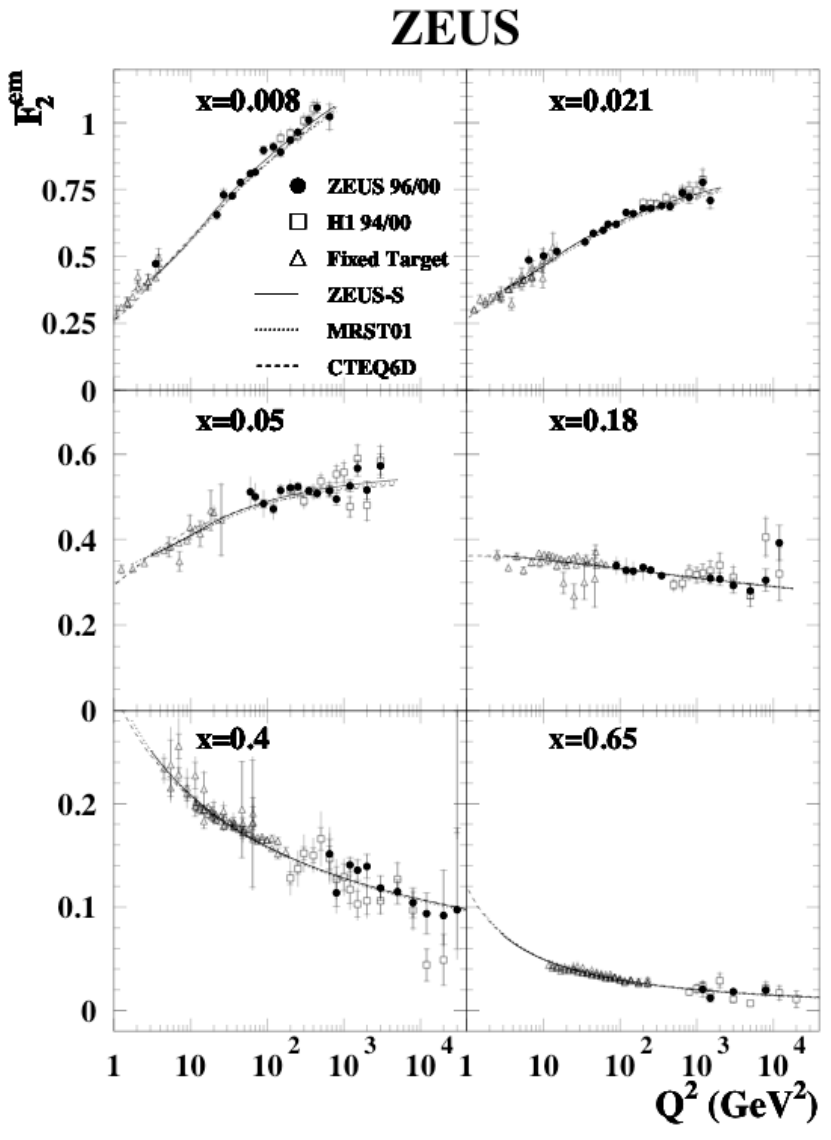
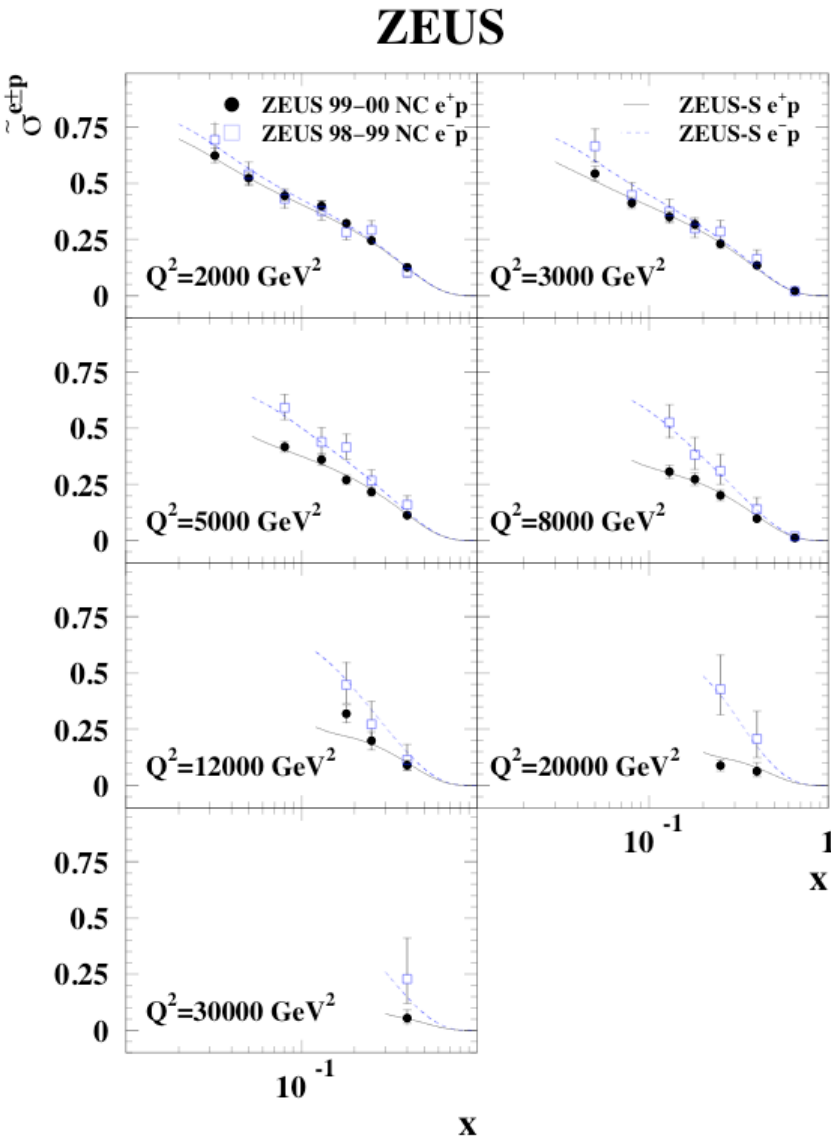
- There is limited data on cross sections at high- x and high Q^2



BCDMS has measured F_2 up to $x=0.75$

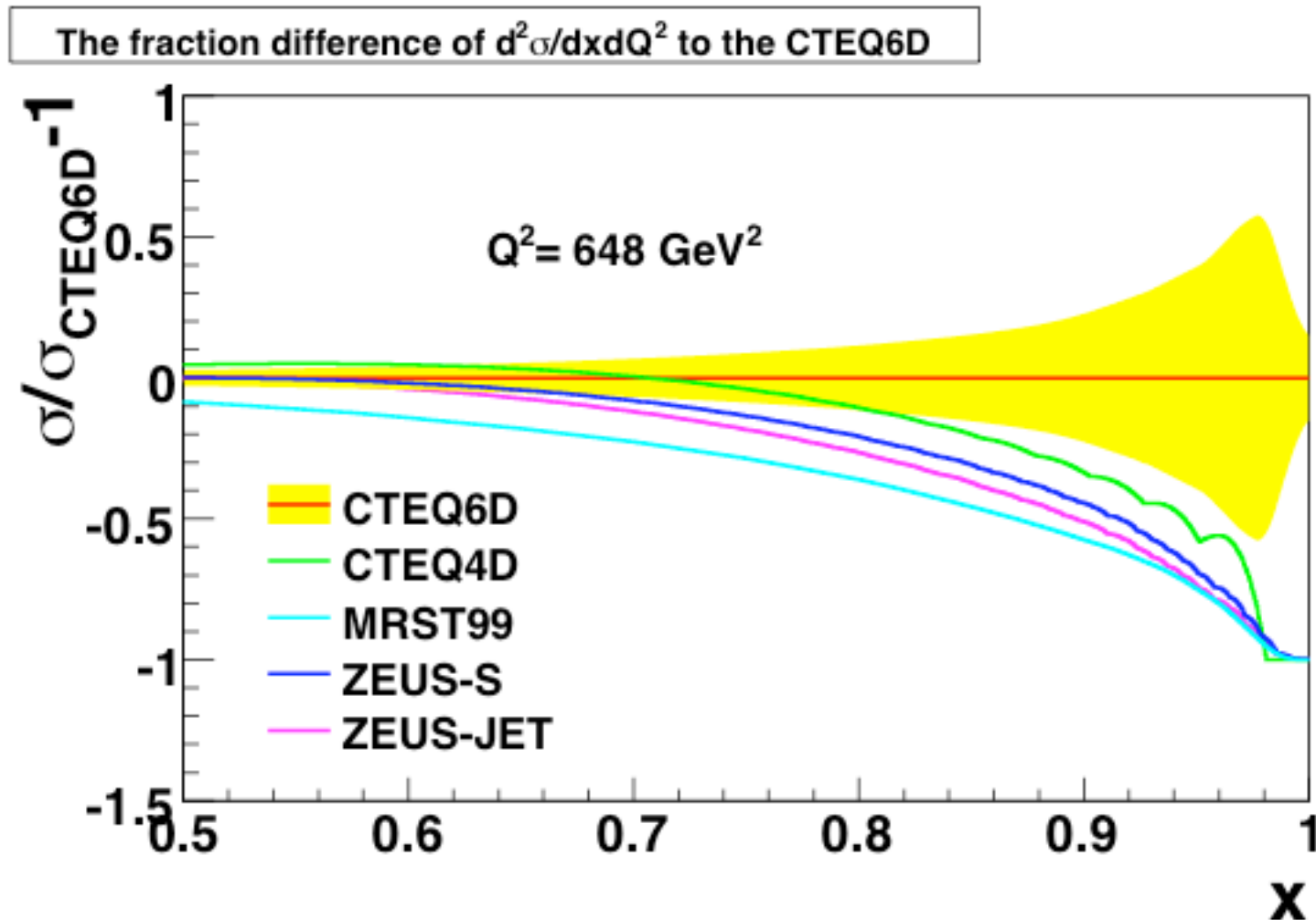
H1, ZEUS have measured F_2 up to $x=0.65$

Motivation

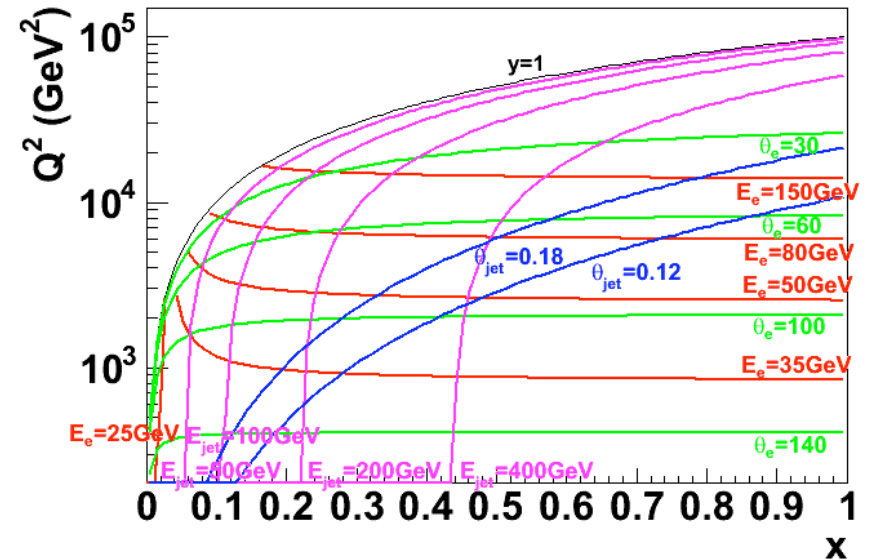
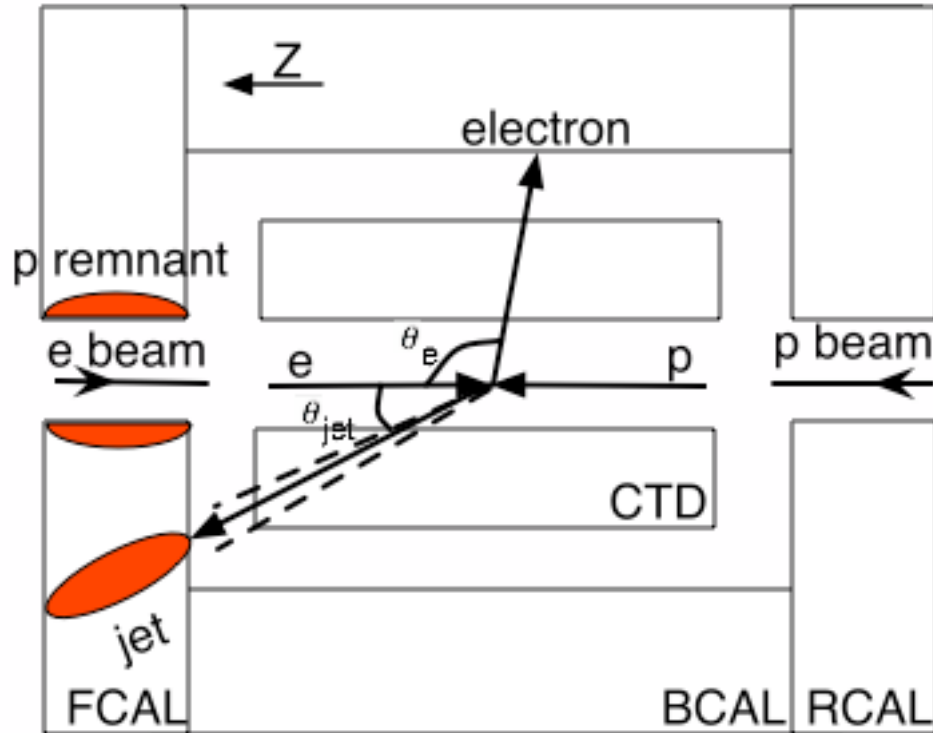


Motivation

- The PDF's are poorly determined at high- x . Sizeable differences despite the fact that all fitters use the same parametrization $xq \propto (1-x)^\eta$. Is it possible to check this ?



HERA high-x



- At high Q^2 , scattered electron seen with $\approx 100\%$ acceptance

- For not too high x , measure x from jet: $\frac{d^2\sigma}{dx dQ^2}$

- For $x > x_{Edge}$, measure $\int_{x_{Edge}}^1 \frac{d^2\sigma}{dx dQ^2} dx$

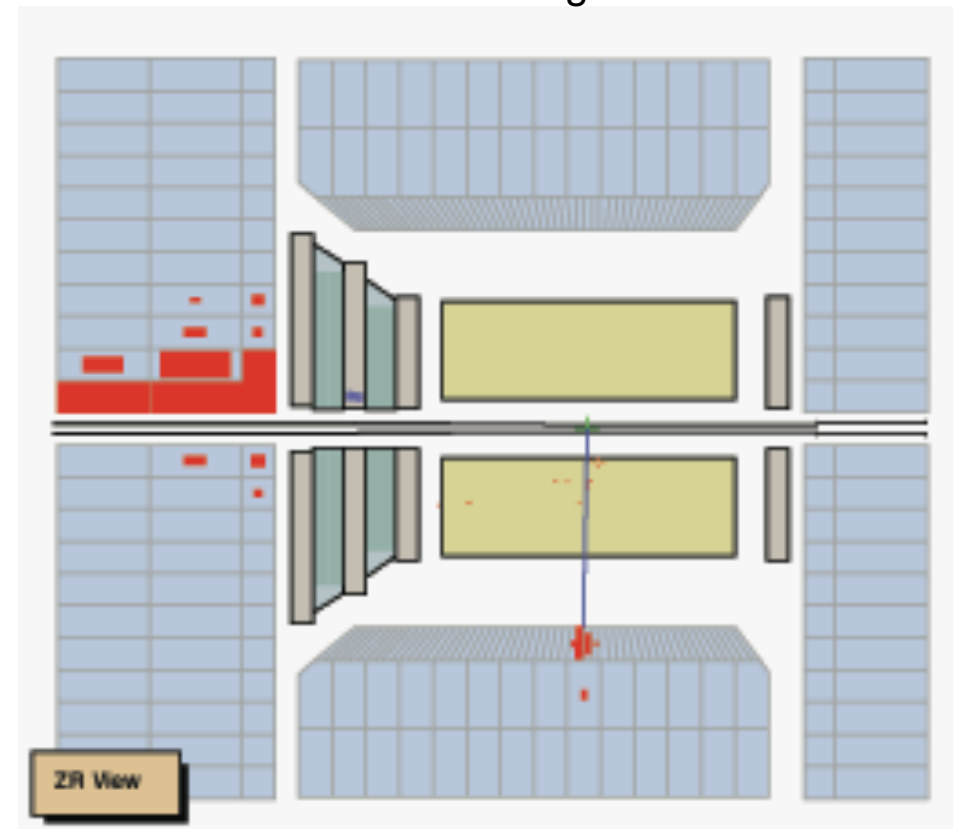
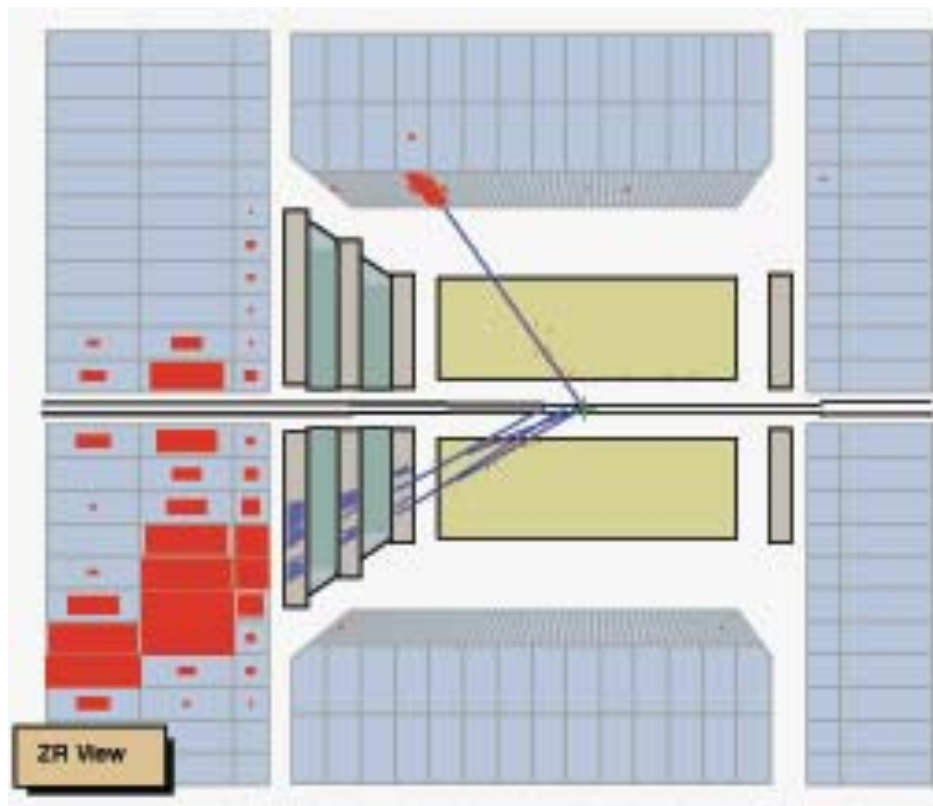
HERA Kinematics

Jet found

$$X < X_{\text{Edge}}$$

No jet found

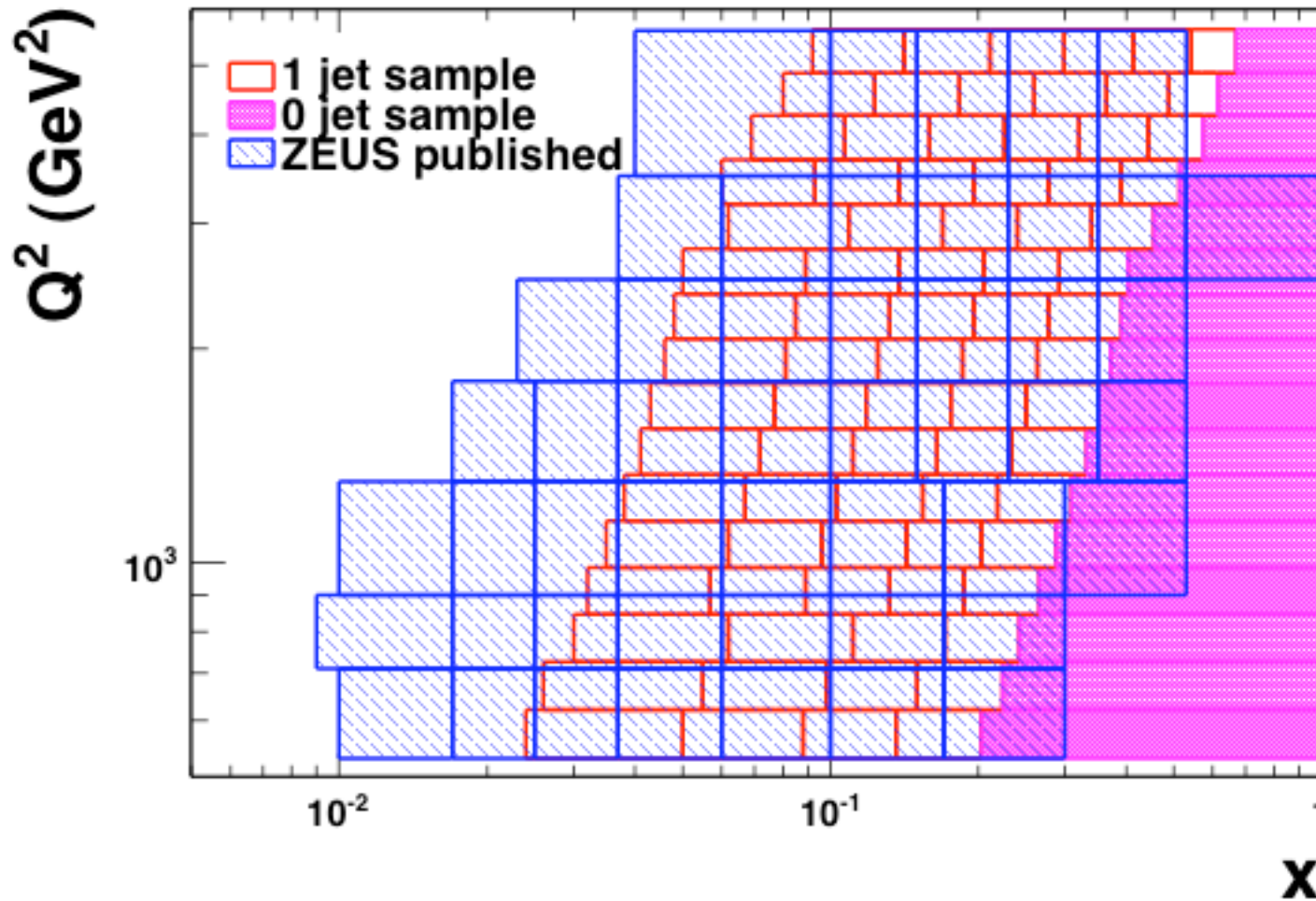
$$X > X_{\text{Edge}}$$



Jet definition: $E_T > 10$ GeV, $\theta_{\text{jet}} > 0.12$

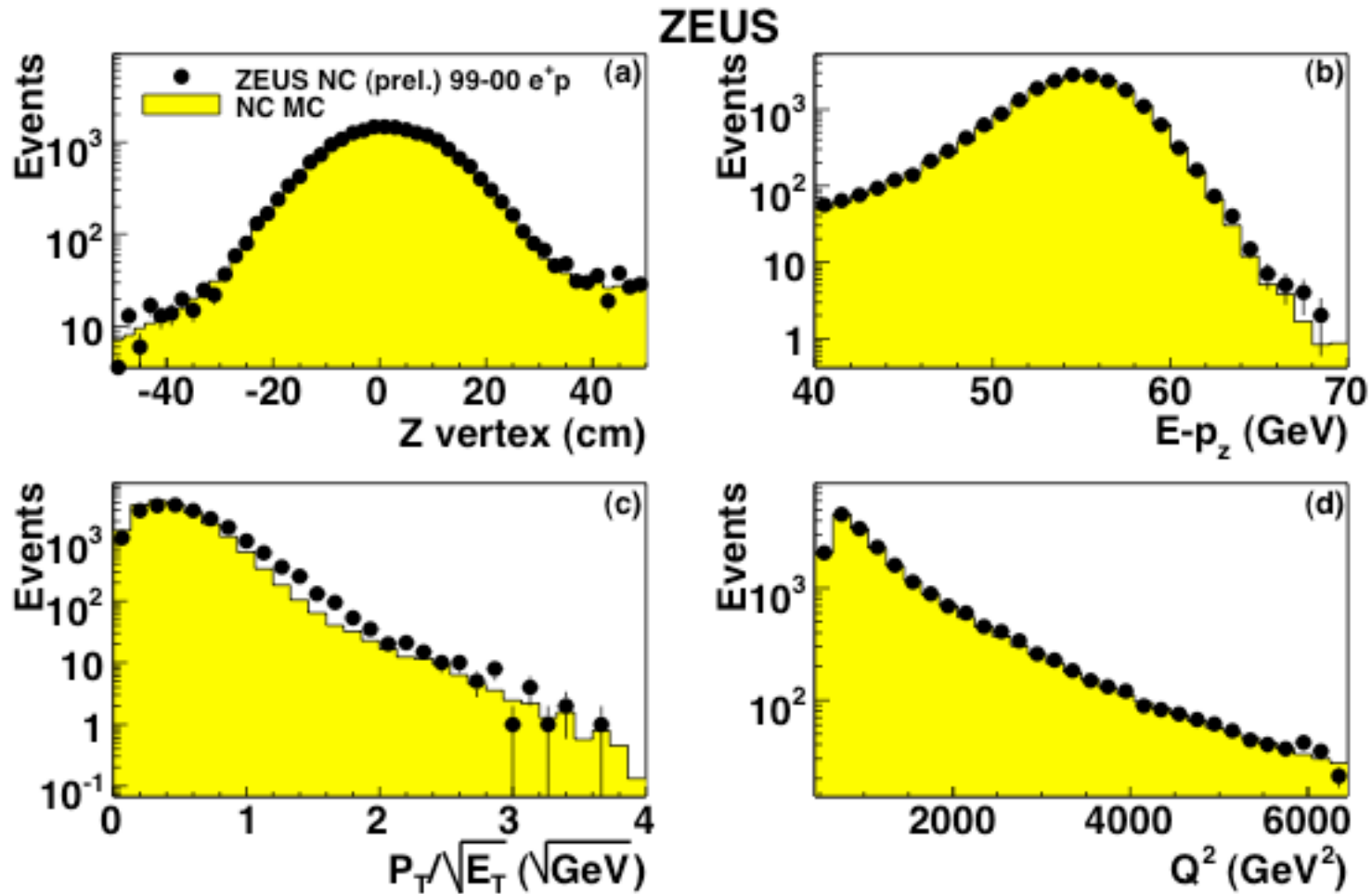
only 0,1 jet events used

Binning



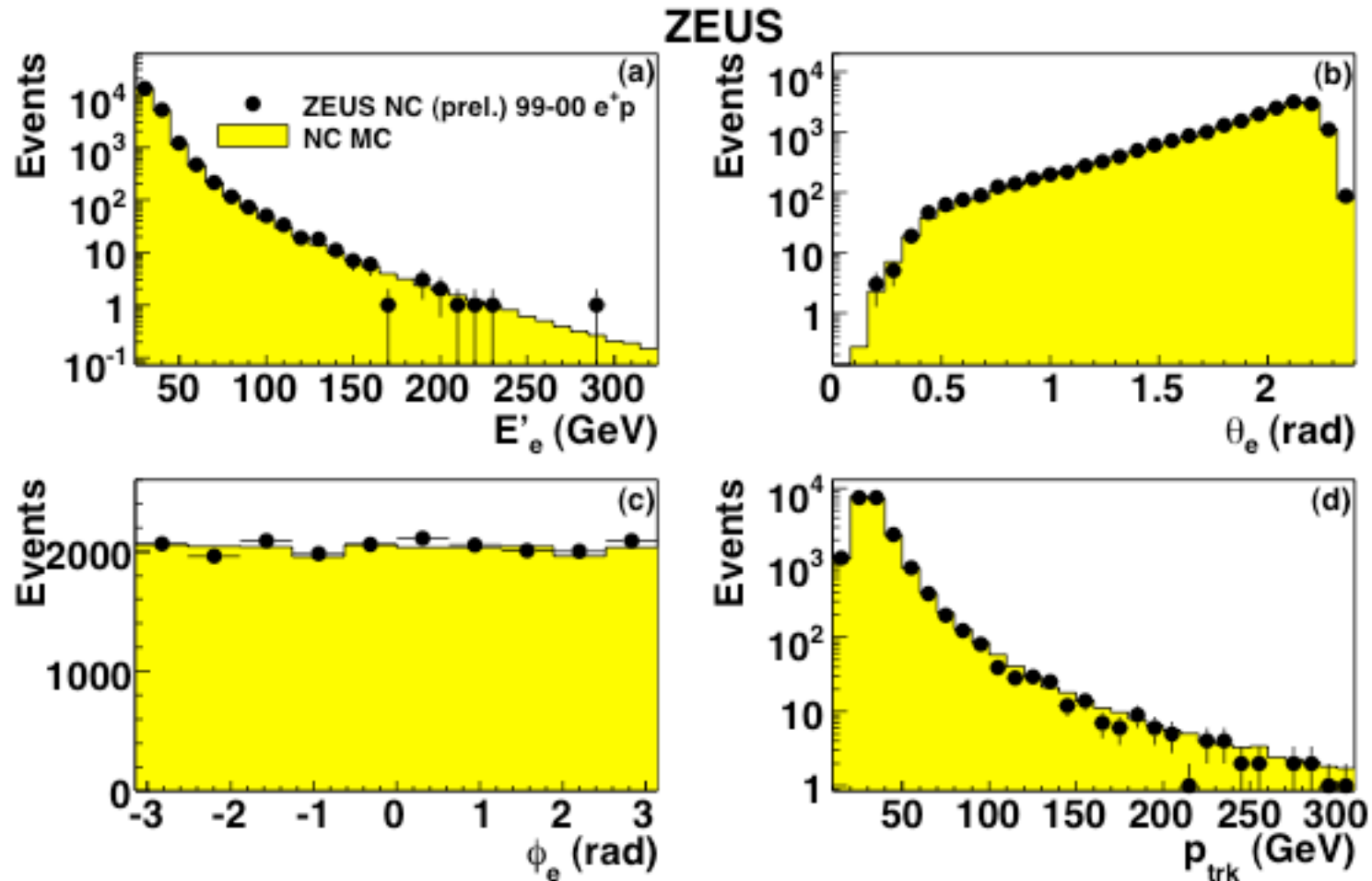
Analysis performed on 96-97 e^+P ($E_p=820 \text{ GeV}$), 98-99 e^-P , and 99-00 e^+P data

Control Plots



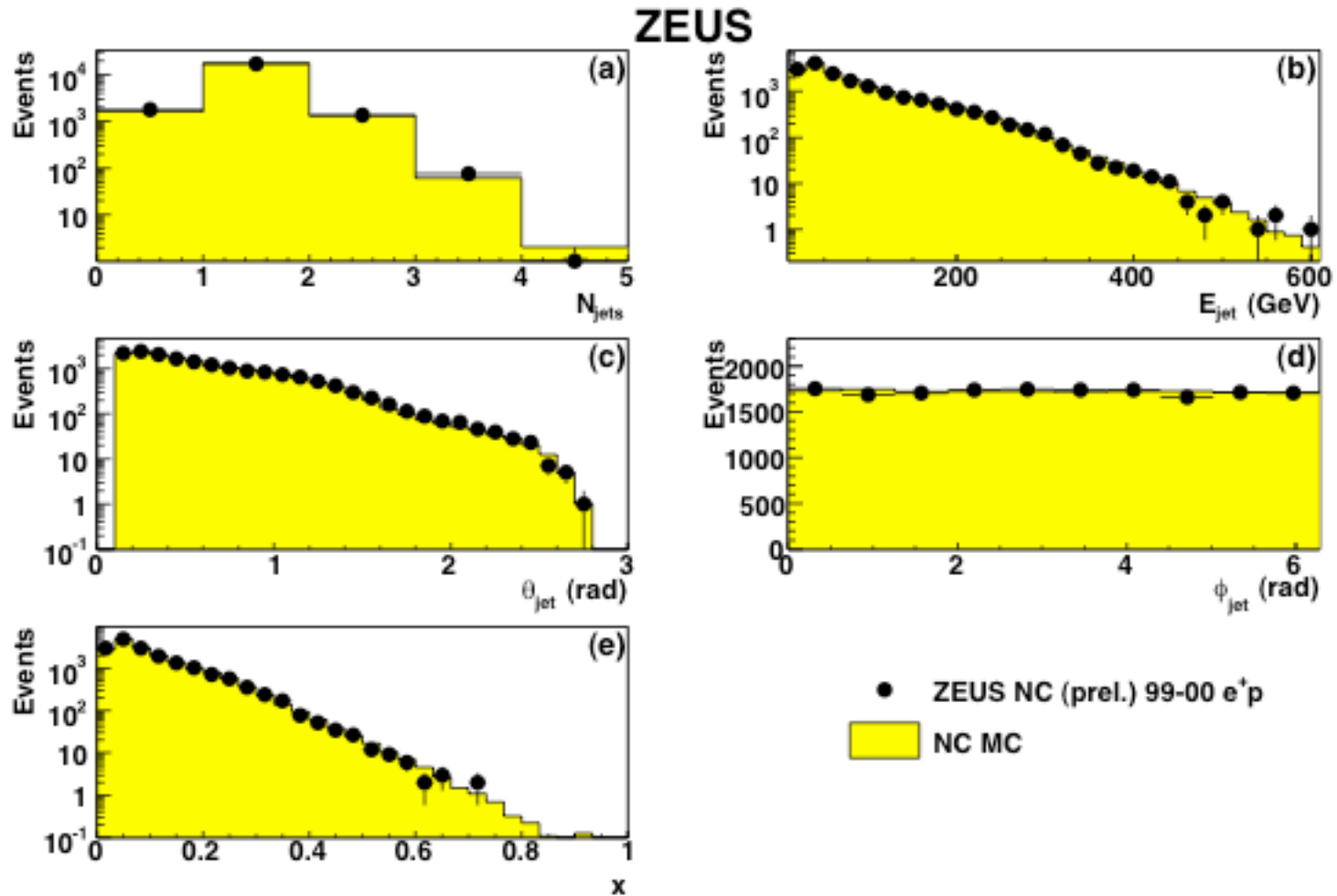
Note: MC is MEPS+Lepto (better reproduction of high x data than ARIADNE)

Control Plots



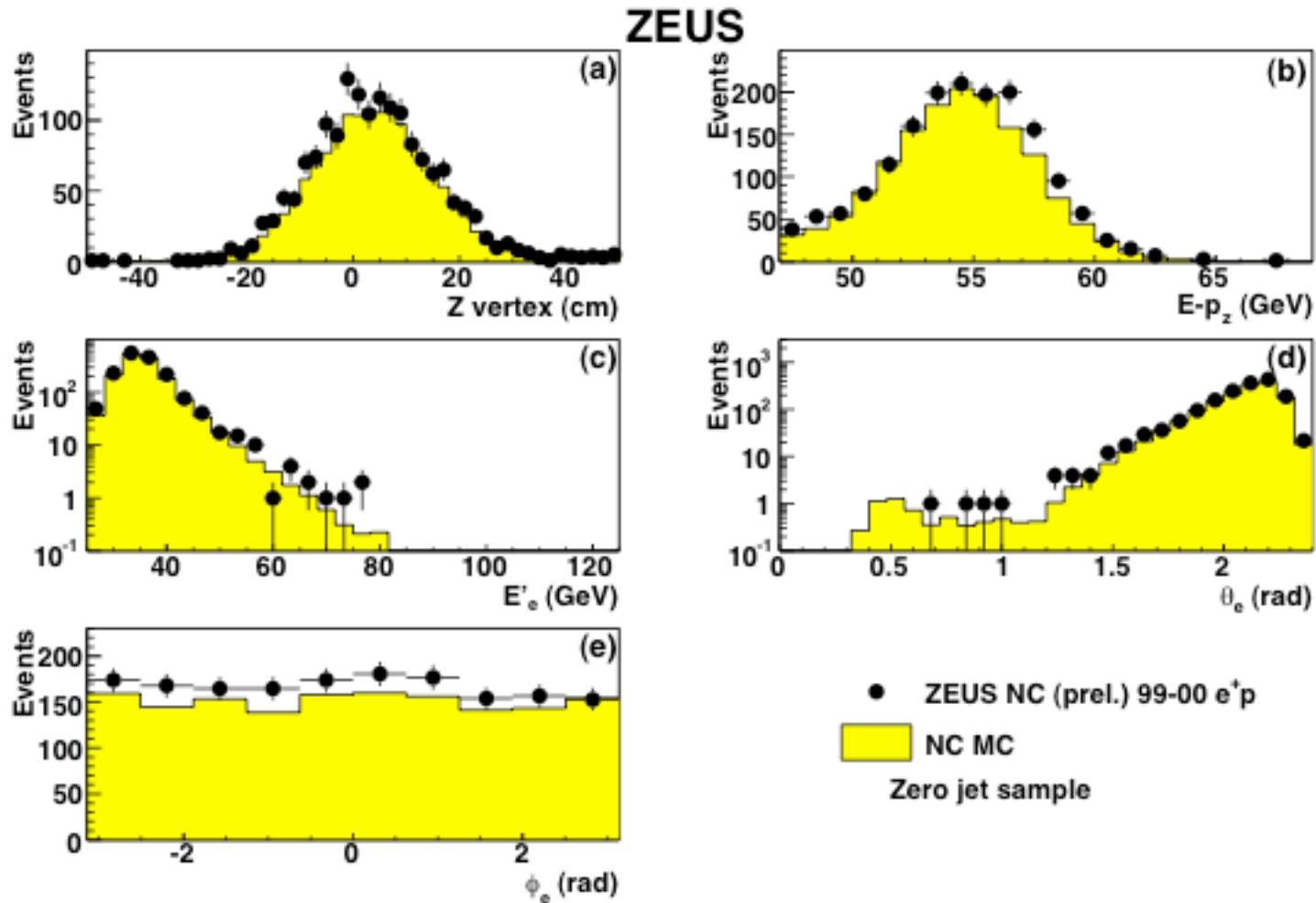
Electron control plots: electron used to define Q^2

Control Plots



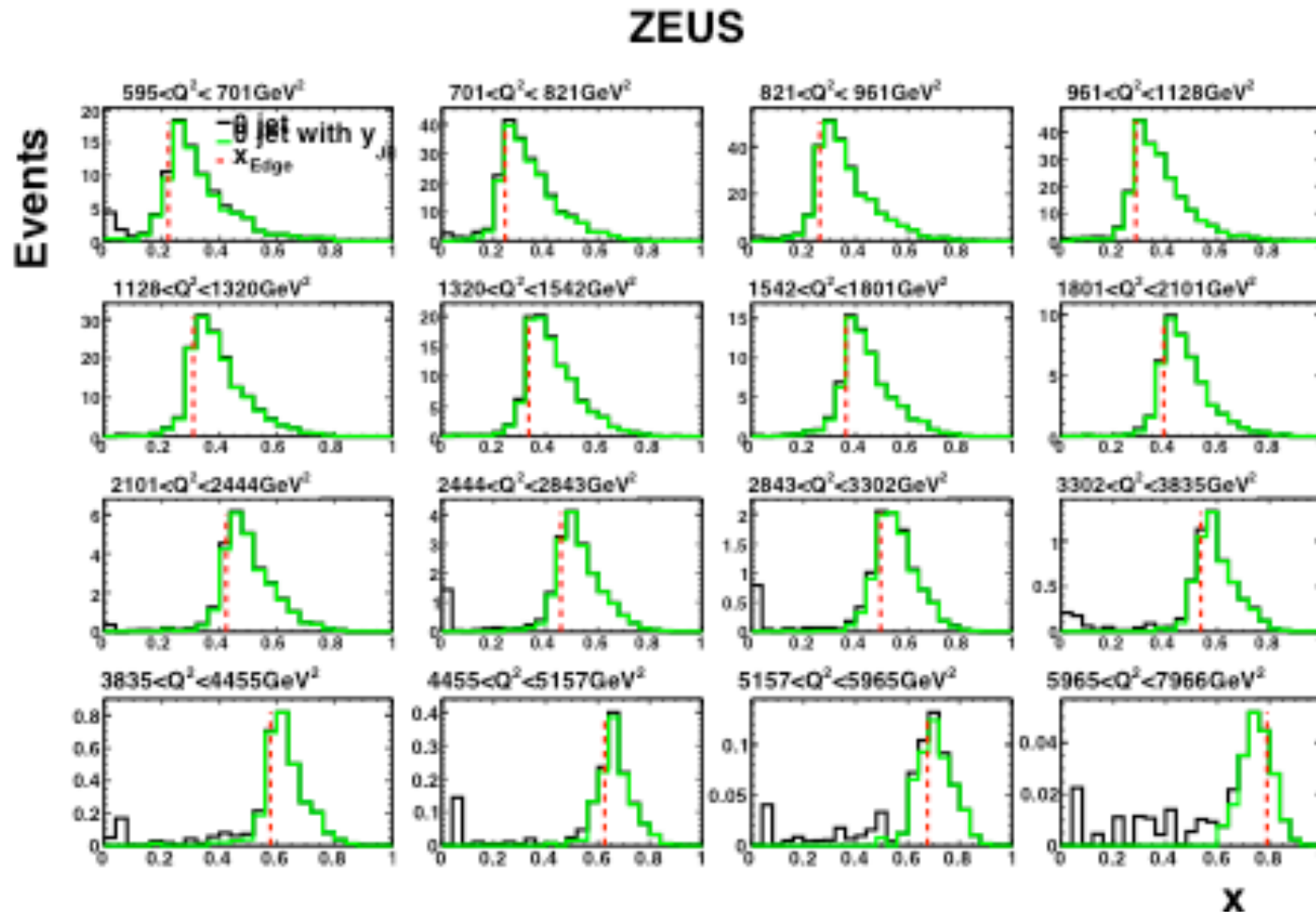
Jet control plots: jet used to define x

Control Plots



Control plots for 0 jet events

MC study of 0-jet events

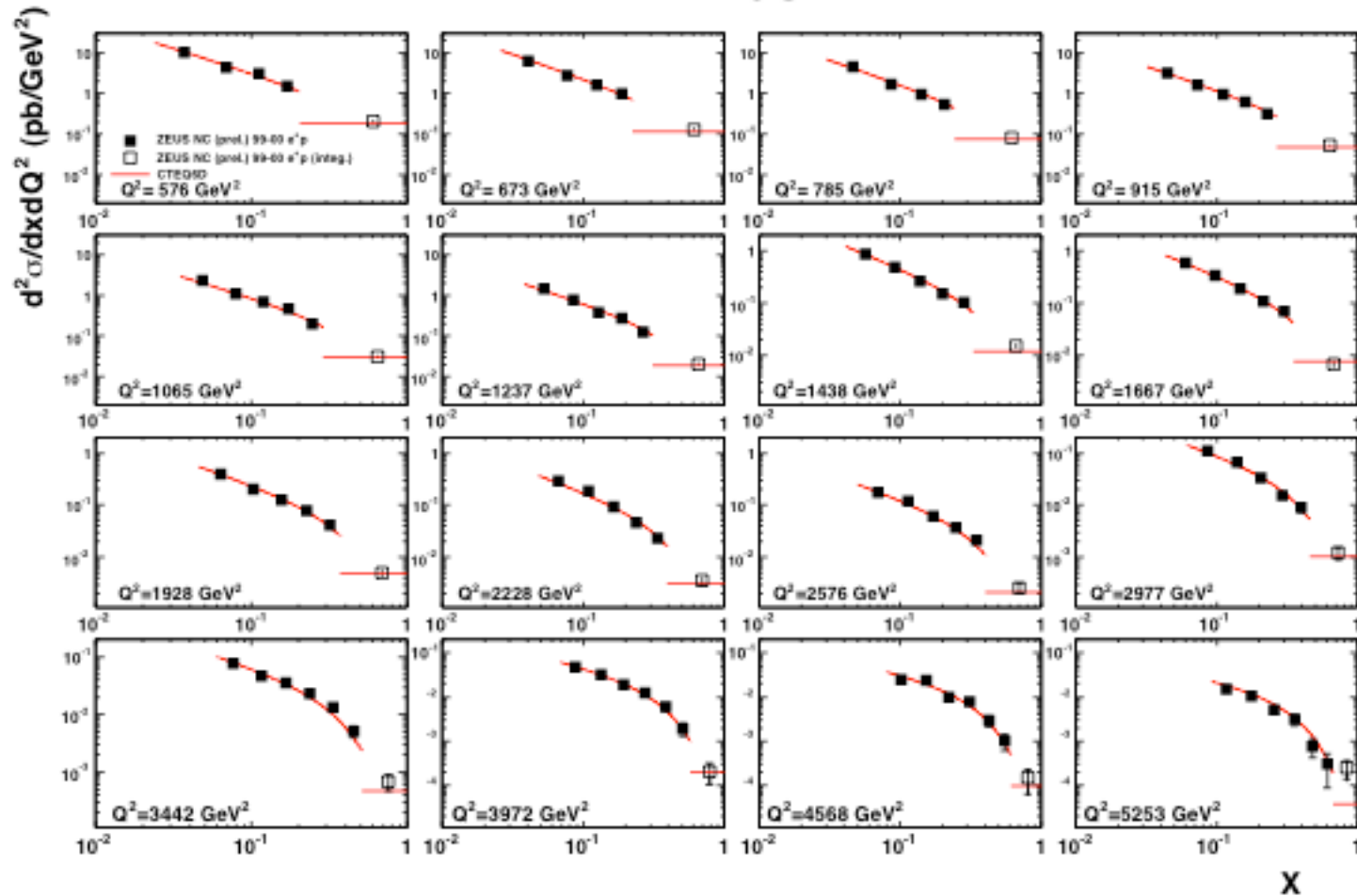


0-jet events are true high-x events. Note: y_{JB} cut improves purity further by removing migration from smaller x

Results

99-00 e⁺P

ZEUS

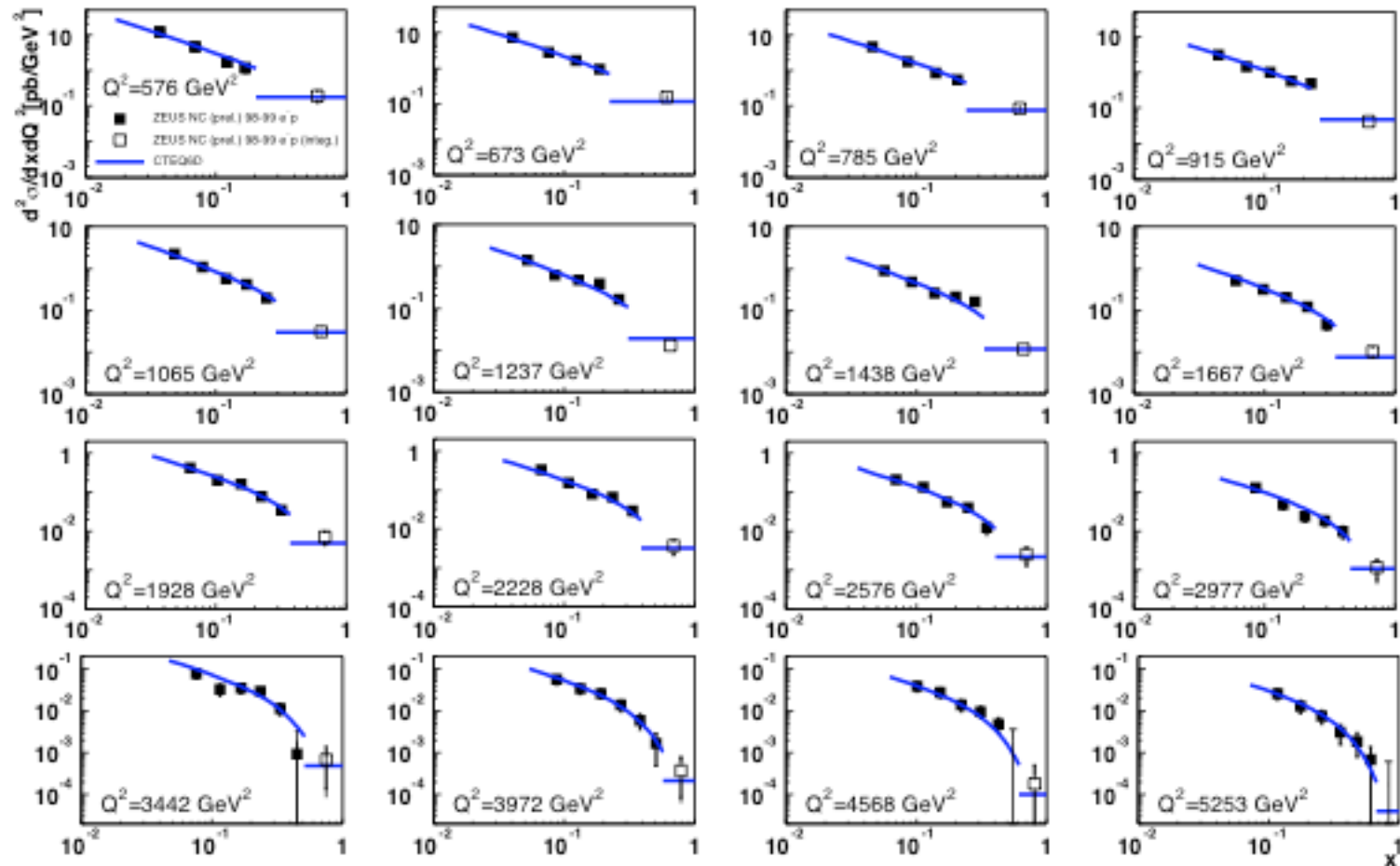


Red line is expectation from CTEQ6D

Results

98-99 e-P

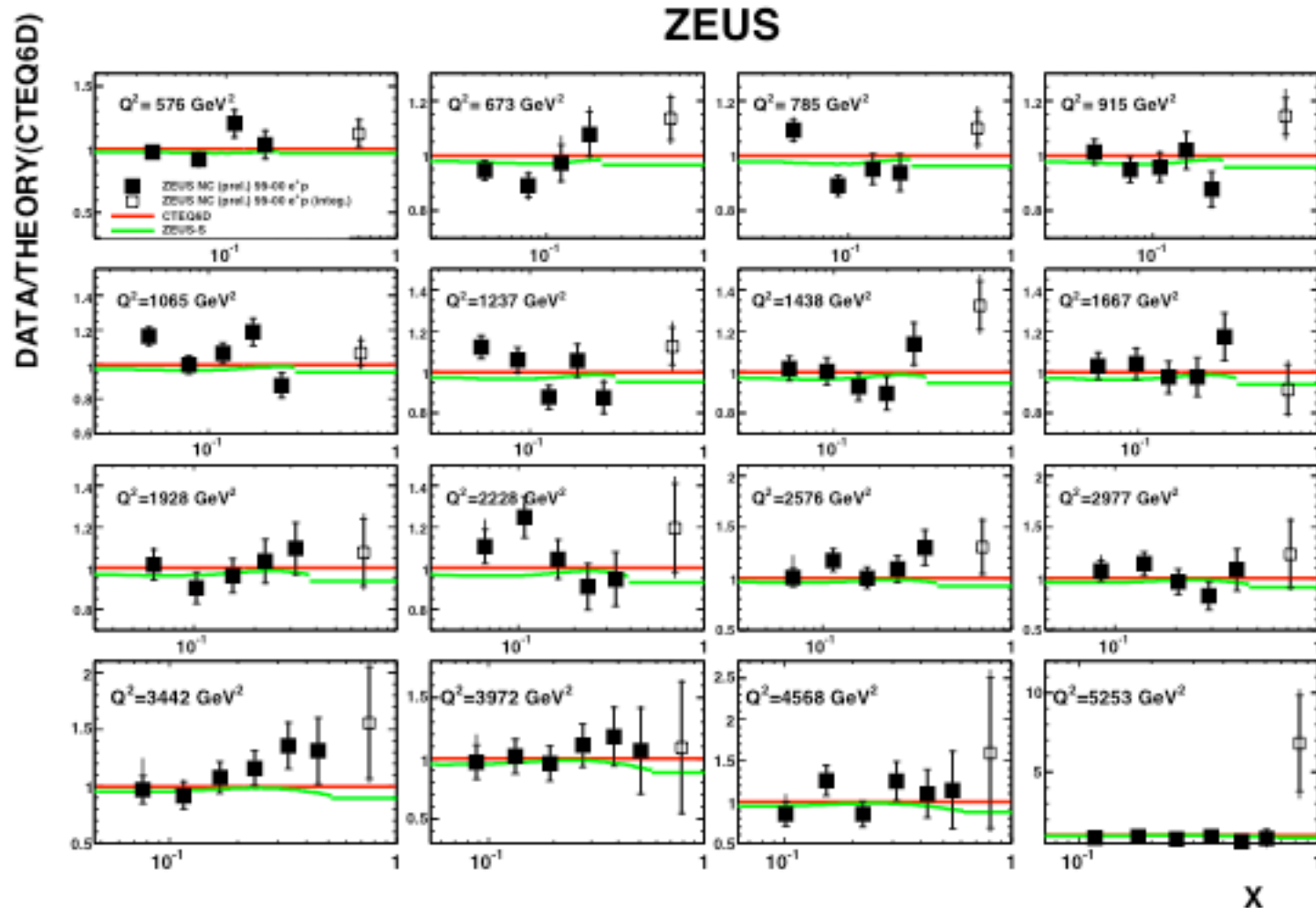
ZEUS



Blue line is CTEQ6D expectation

Results

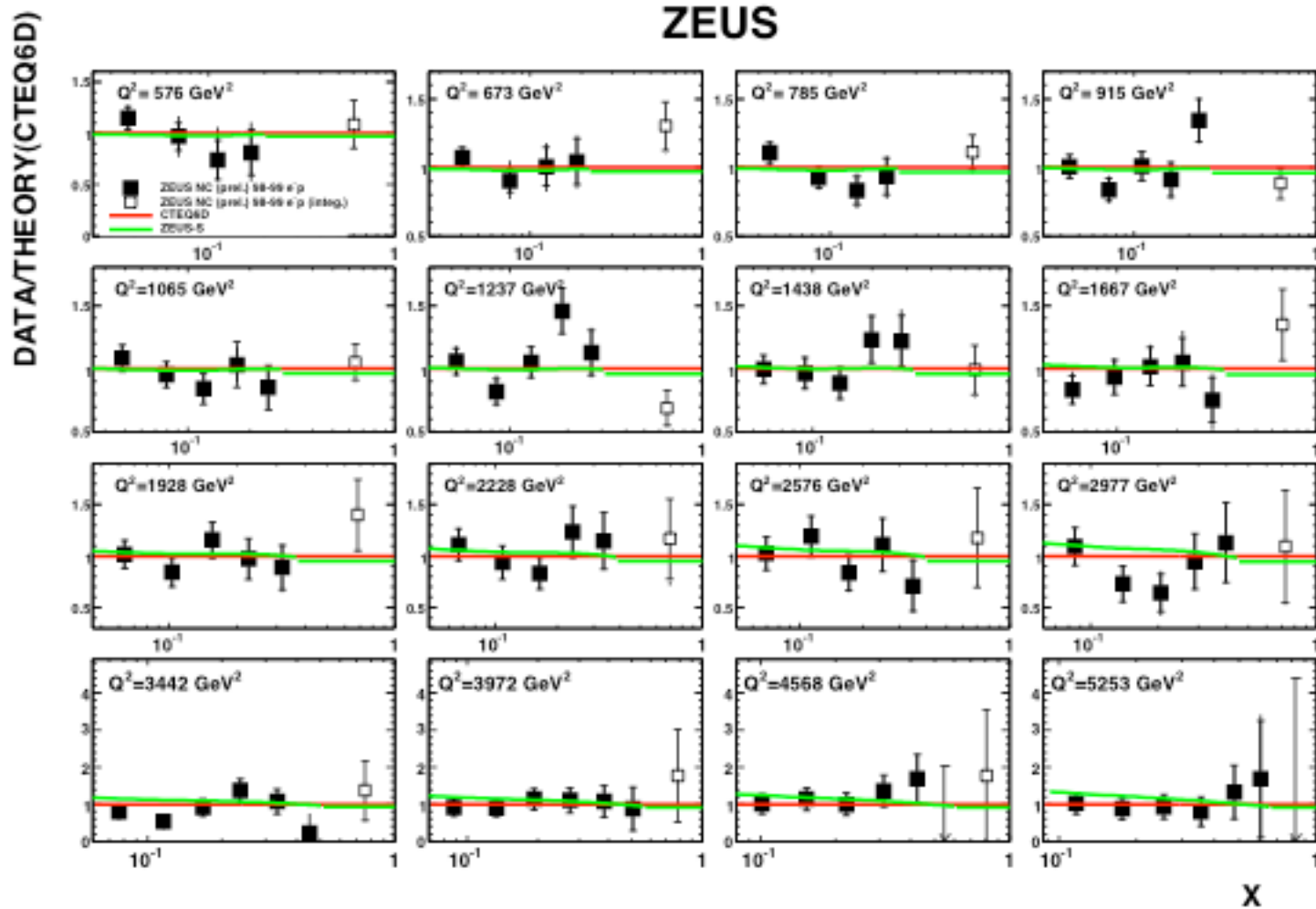
99-00 e⁺P



Good agreement with CTEQ6D in previously measured region.
Data tend to lie above expectations at highest x.

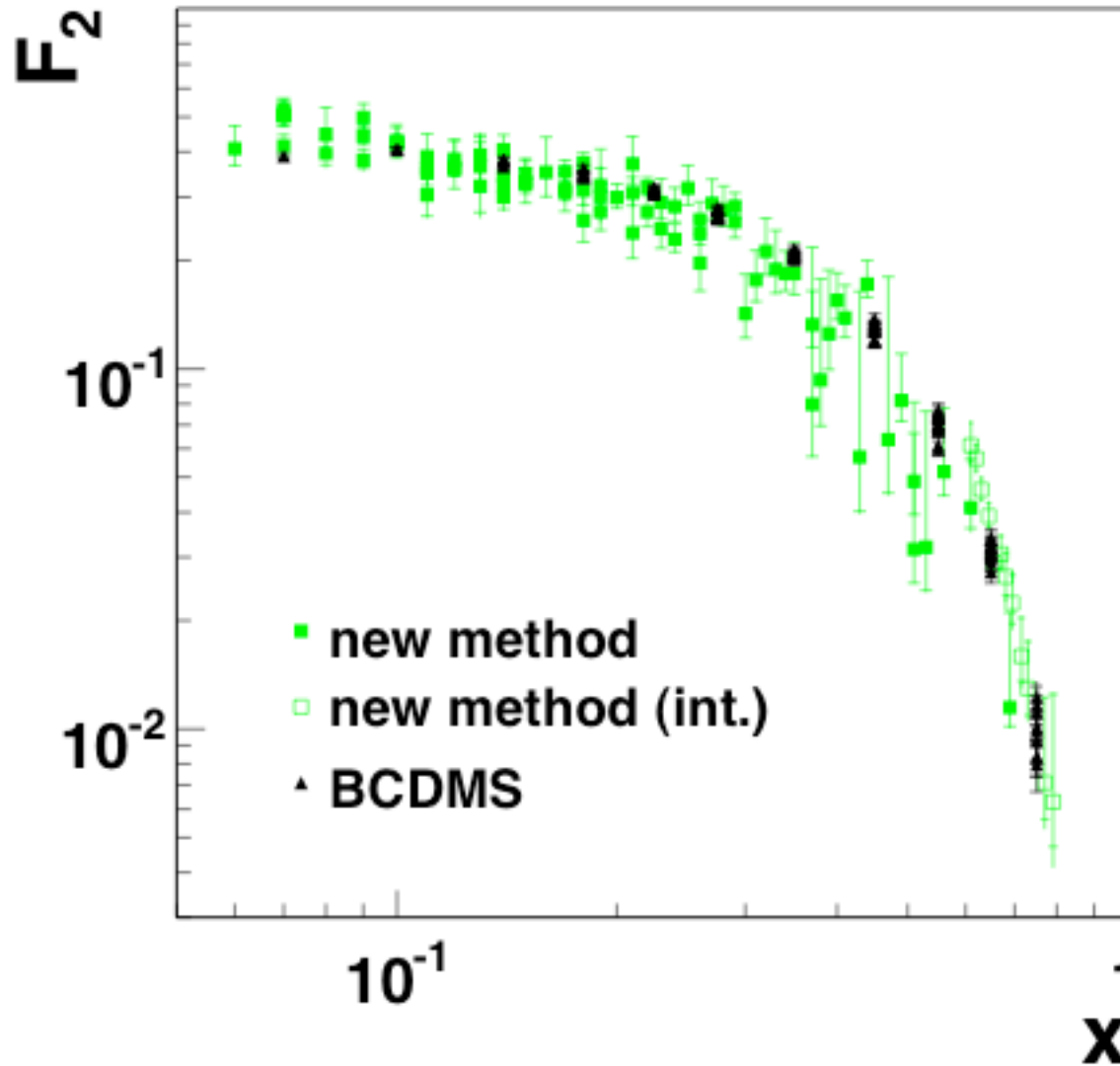
Results

99-00 e-P



Good agreement with expectations

Overview of Results



All Q^2 plotted together to give indication of data x range. For integral bins, bin center is plotted.

Discussion

- Cross sections extracted up to $x=1$
- Data tend to lie above expectations from CTEQ6
- First fits show that data will have considerable impact on high x PDFs (not shown).
- High lumi data from HERA-II should allow much better measurements.
- Paper almost ready.