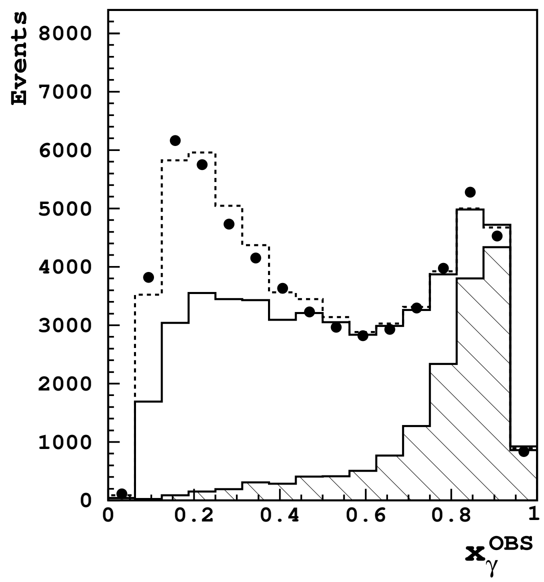
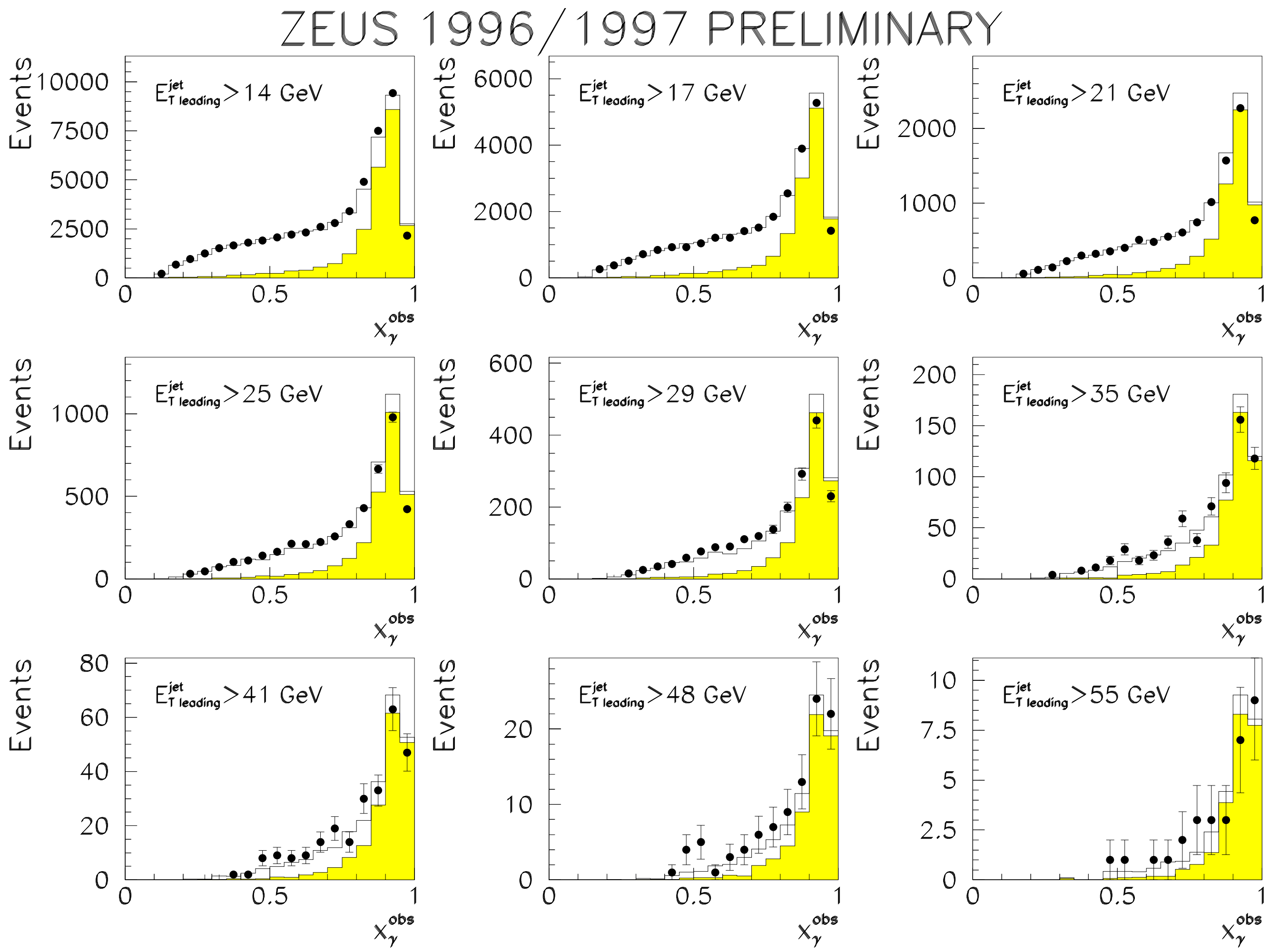
Resolved and Direct γ vs NLO and PDF's



How much photon energy is seen in the hard process

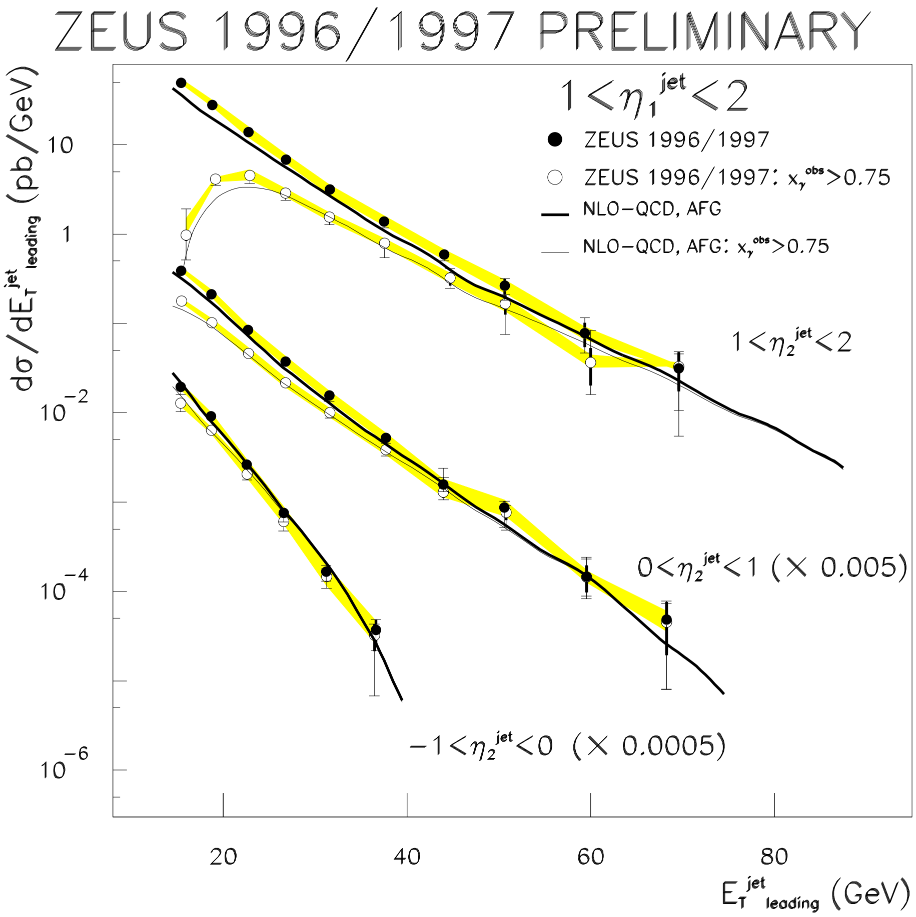
$$x_\gamma^{obs} = \Sigma E_T exp(-\eta)/(2yE_e)$$

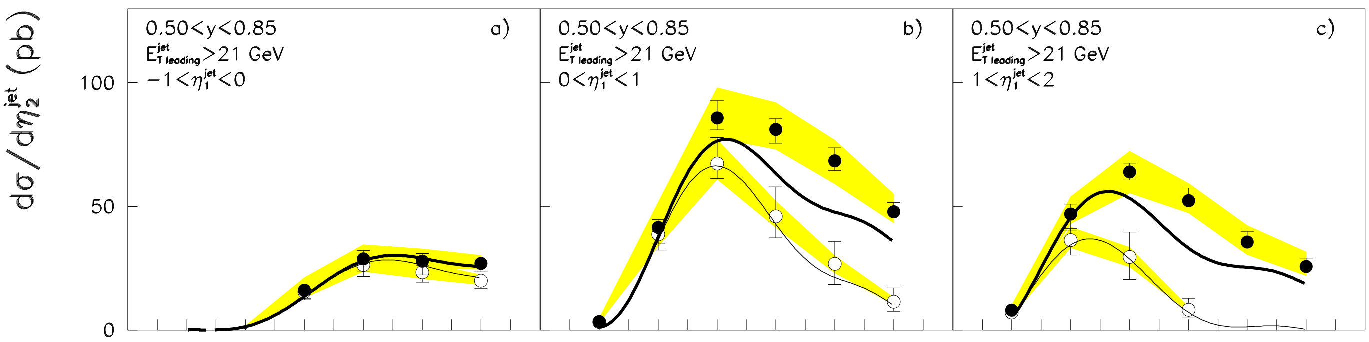
- "underlying" event (MI, pedestal)
- E_T threshold



Resolved and Direct γ cont'd

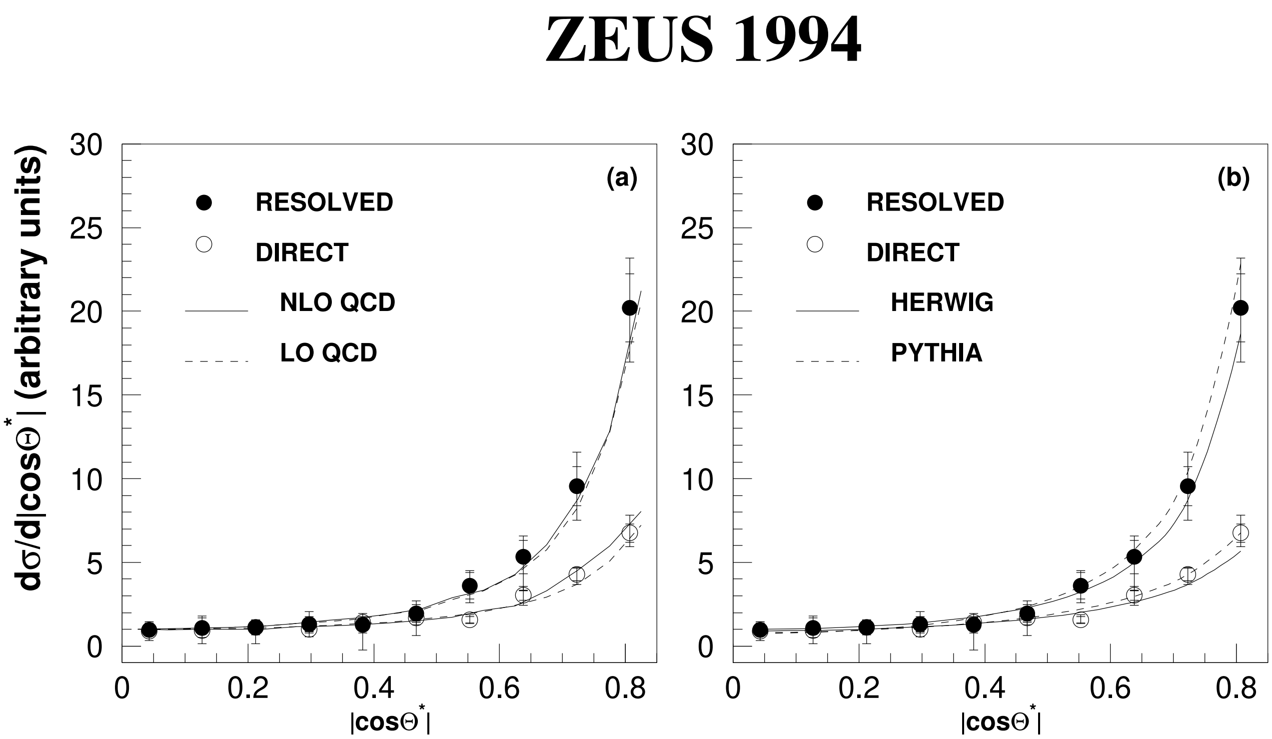
Investigate detailed topology to disentangle dynamics and structure

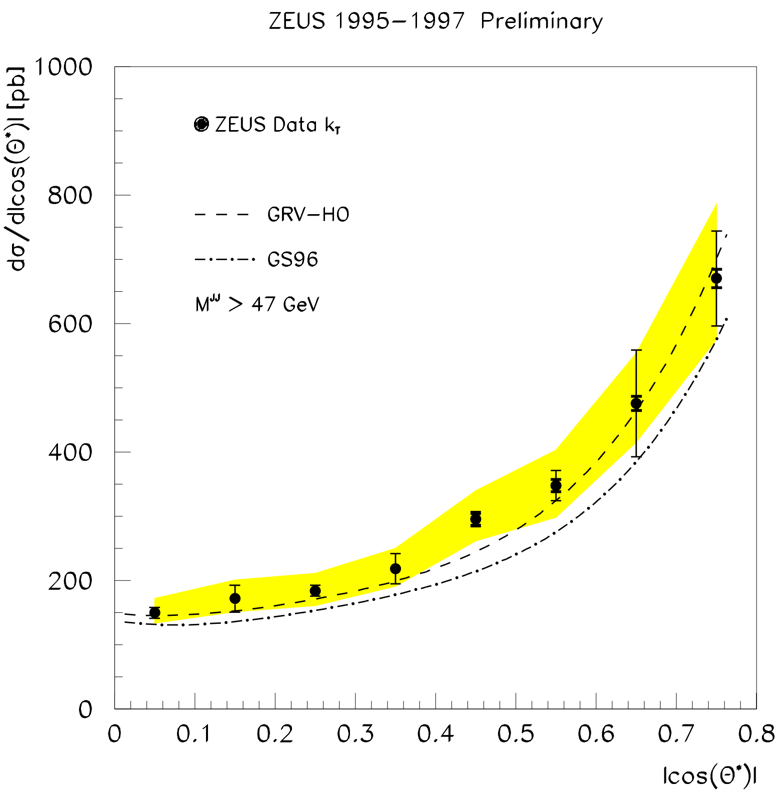




- ▷ direct described
- ▷ resolved fails even for high E_T (jet $\leftrightarrow$ parton)

Resolved and Direct γ cont'd



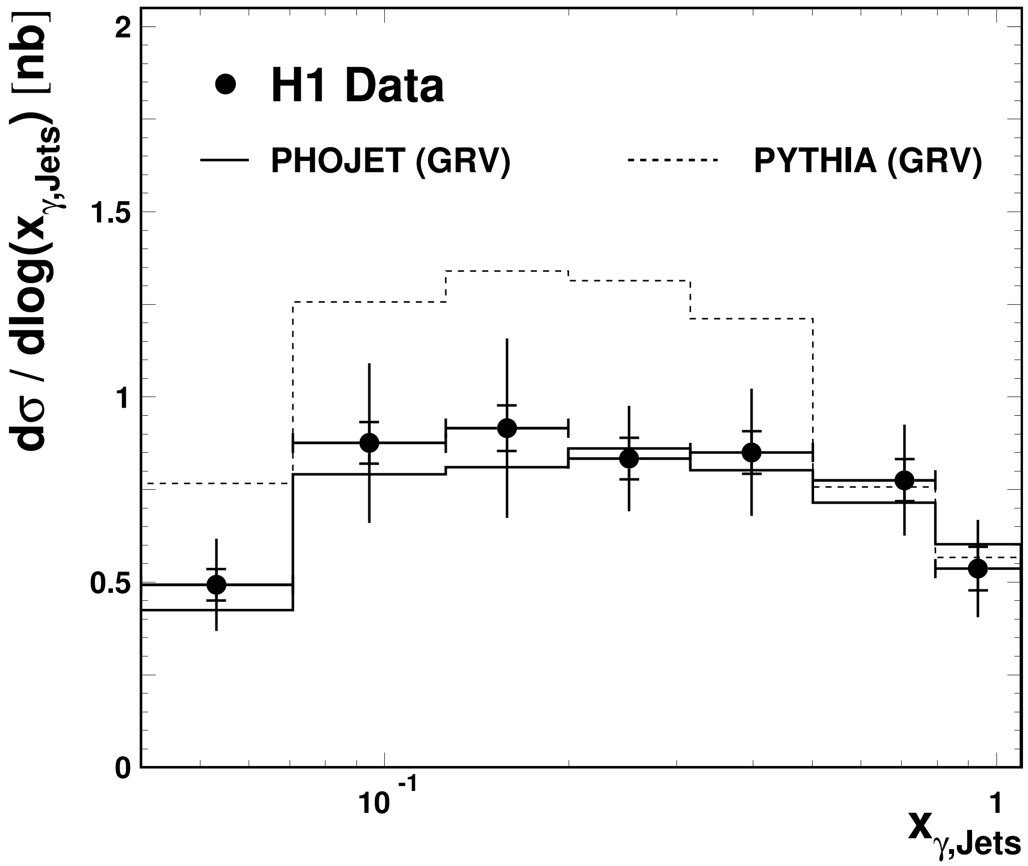


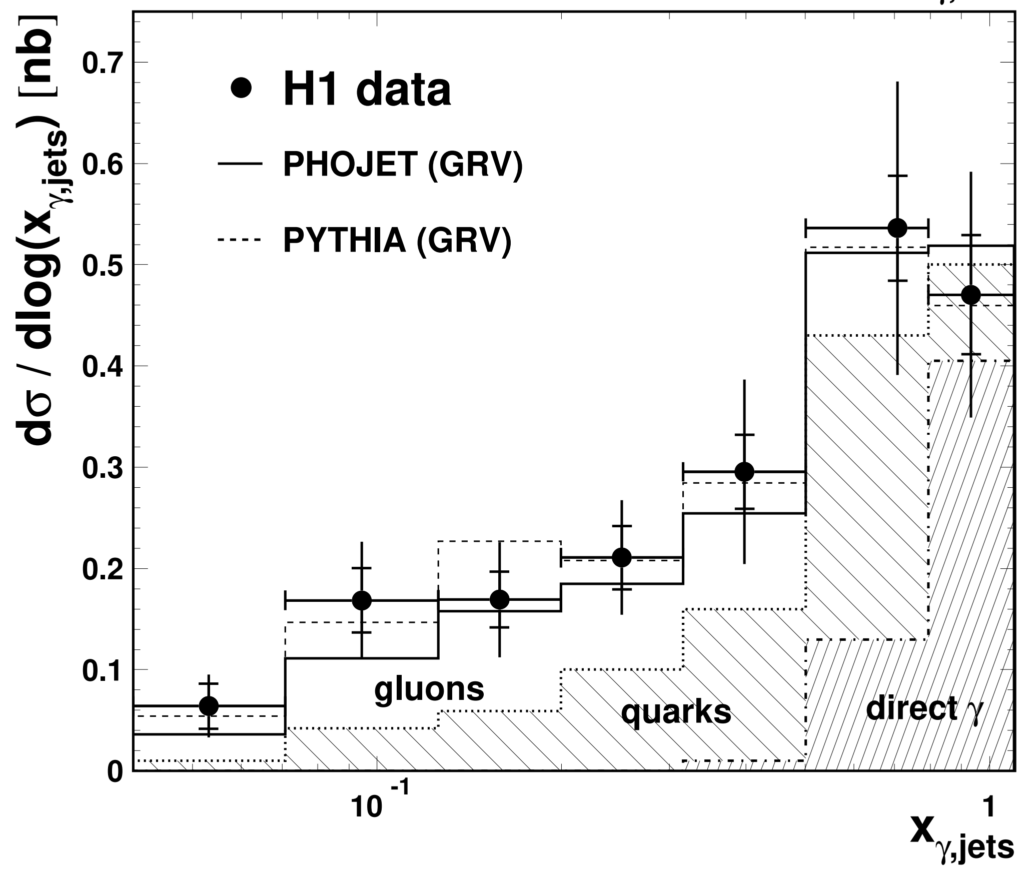
$\cos\theta^\star$ reflects underlying parton dynamcics

More information available:

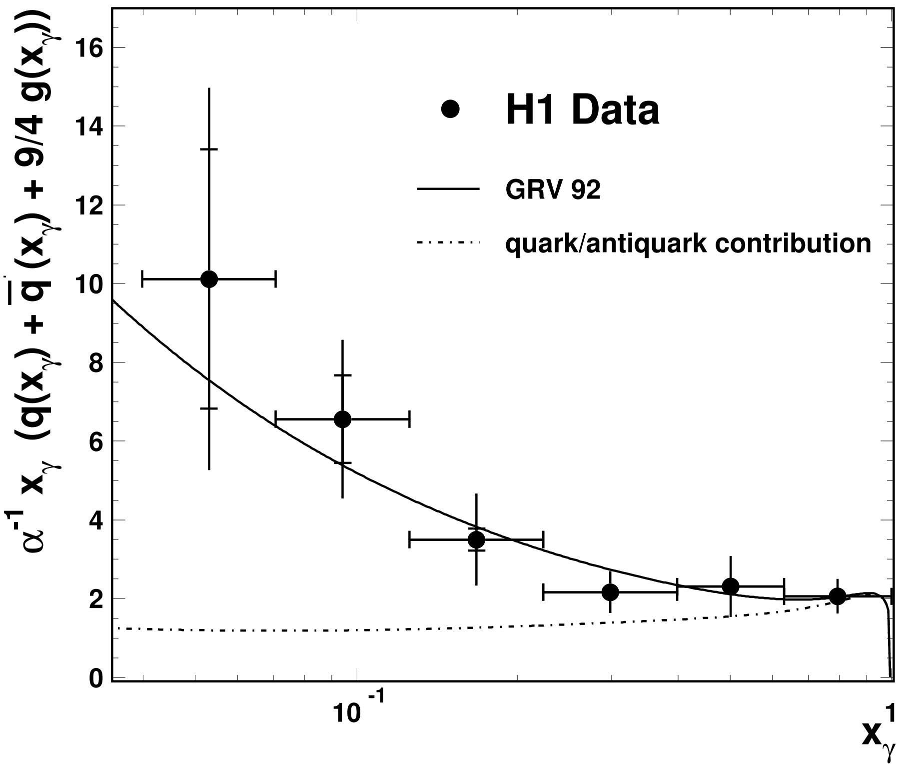
- 3 jet studies
- High masses

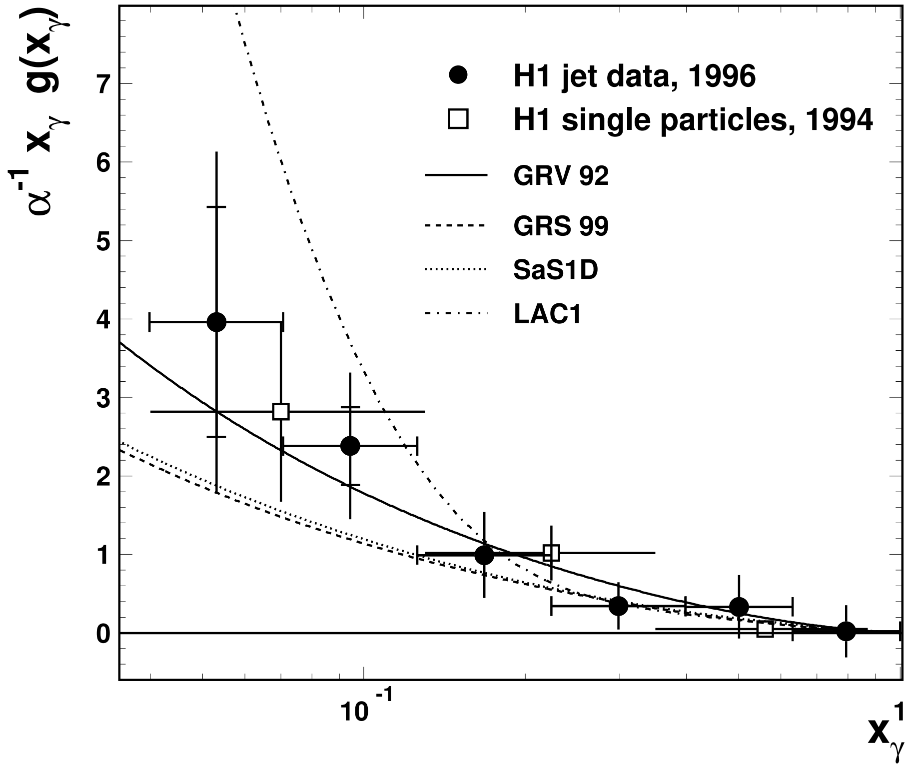
Low E_T PHP Dijets



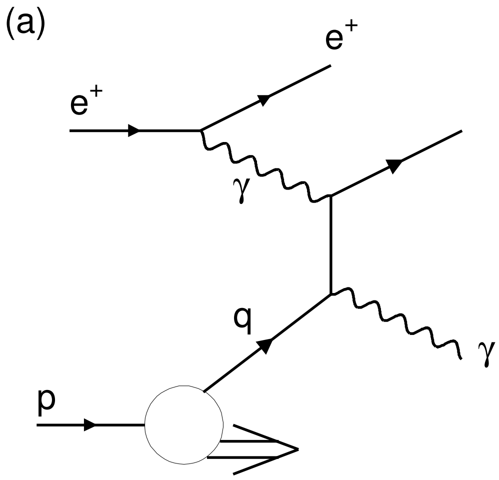


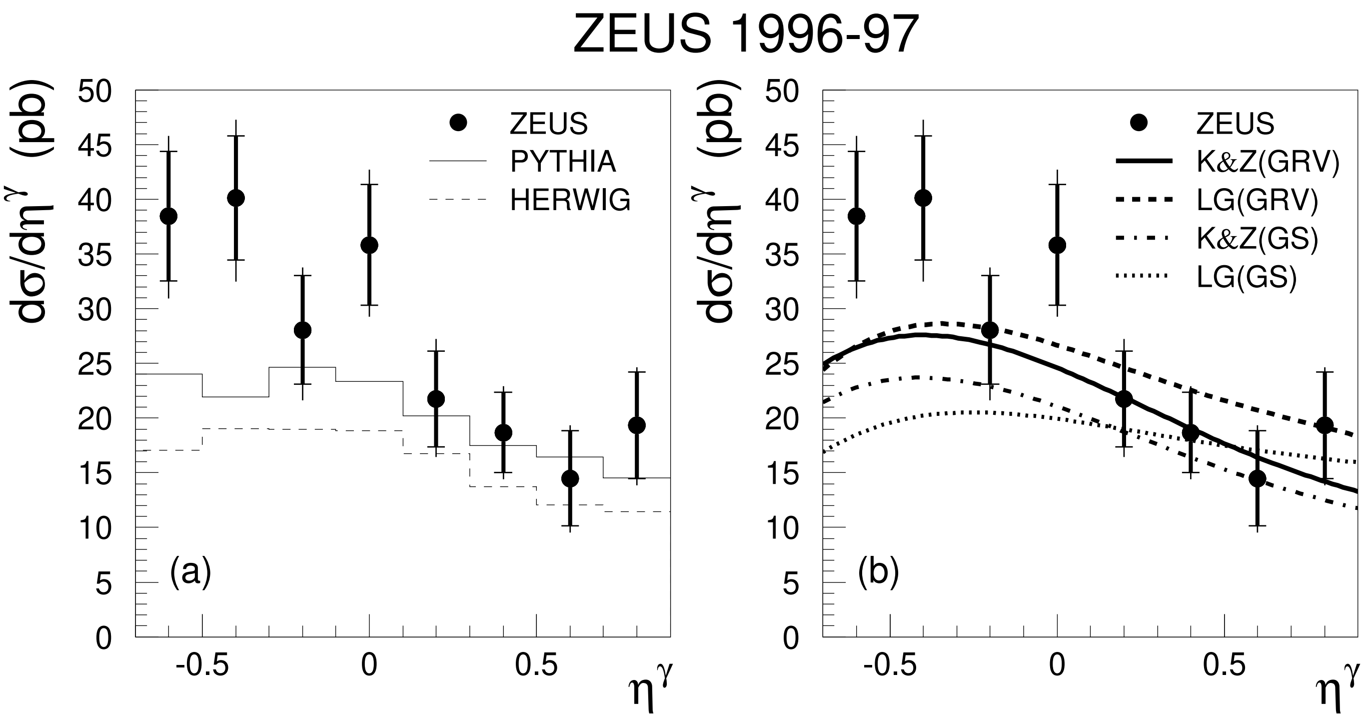
Gluon in the Photon





Prompt Photons





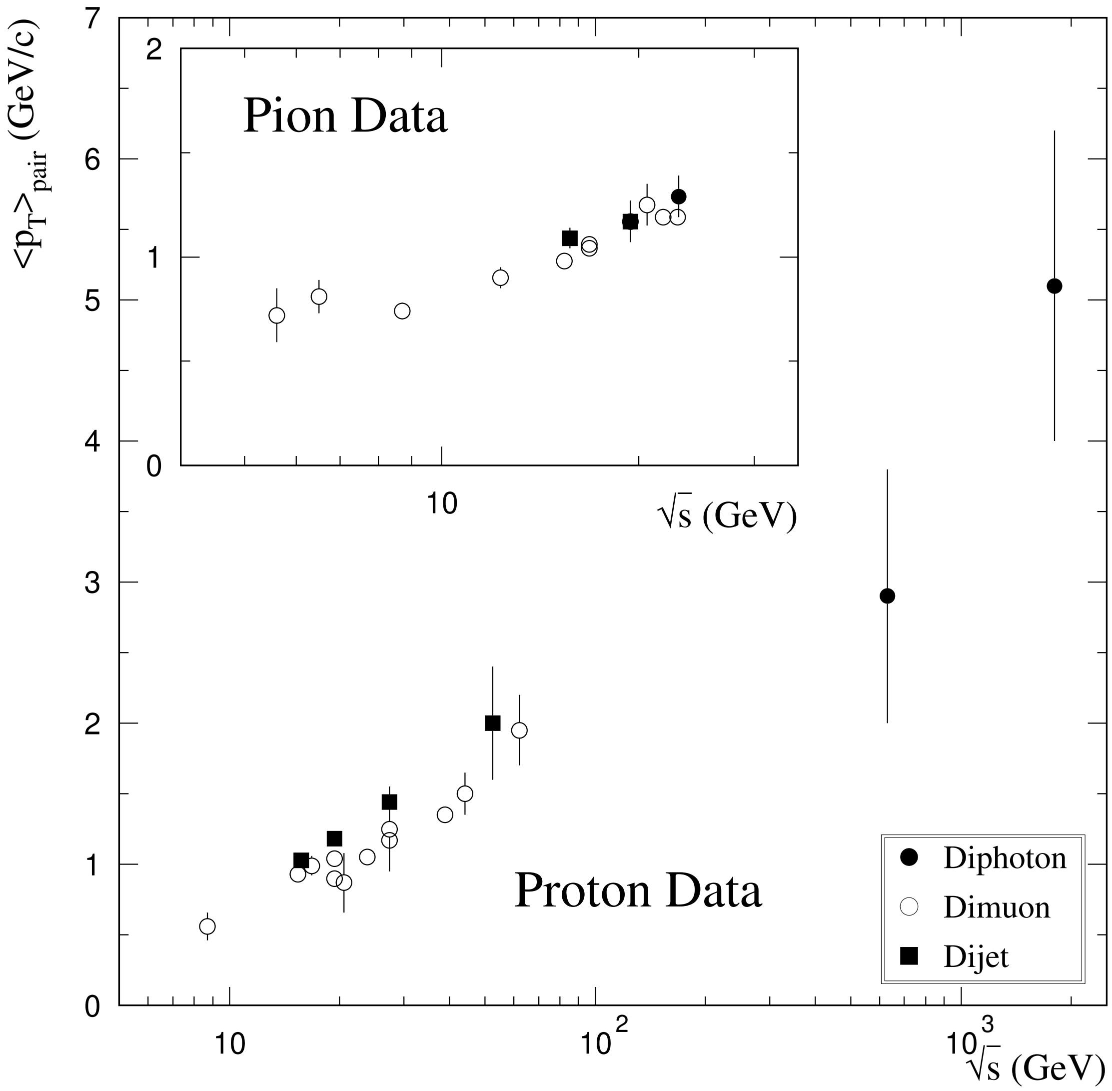
▷ agreement in forward direction

▷ disagreement in rear direction

- same origin as di-jets?
- intrinsic k_T?

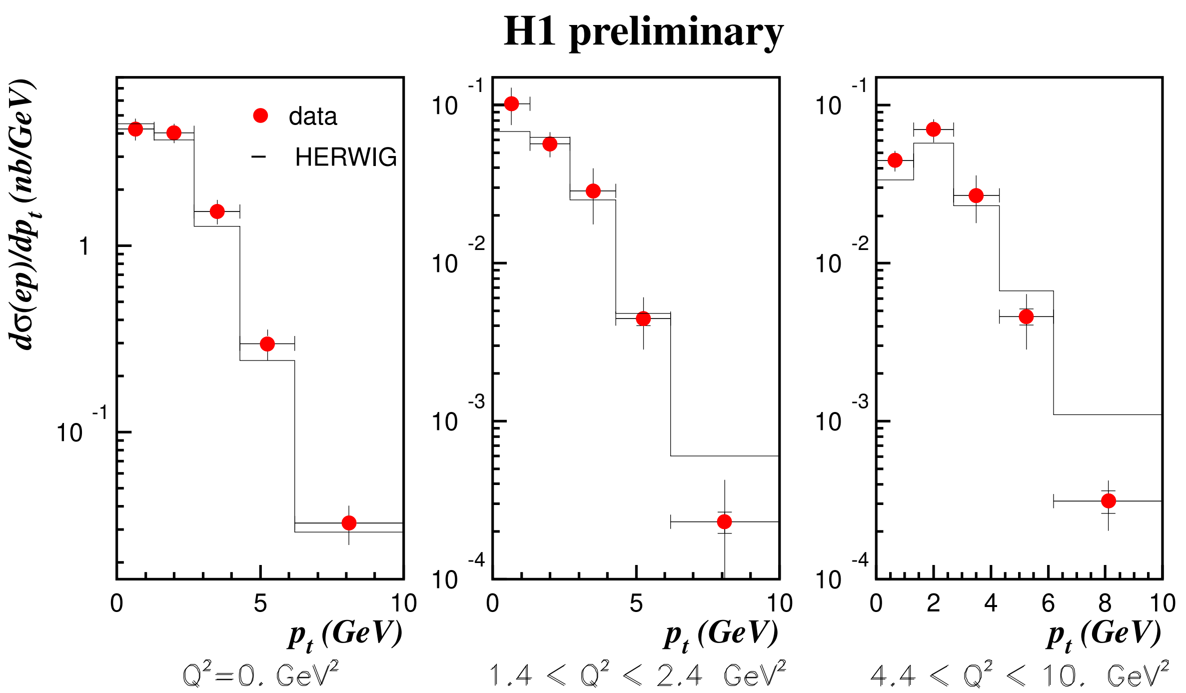
Prompt Photons: Intrinsic k_T

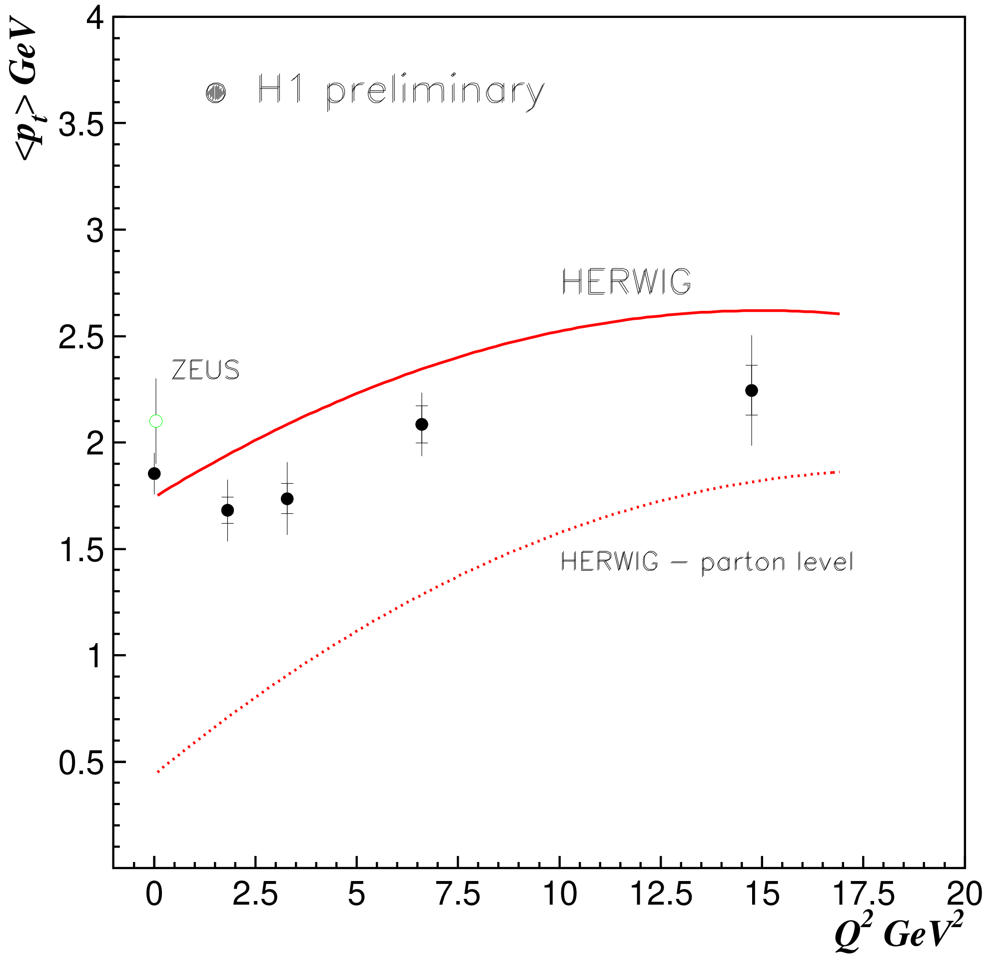
- Recent experimental results: limitations in pQCD description of high p_T prompt photon production (E706, CDF, D0...)
- Is the origin from effects of initial-state soft-gluon radiation, parton-k_t effects?
- k_t modifies back-to-back alignment of final state objects and magnitude and shape of high p_T inclusive cross sections



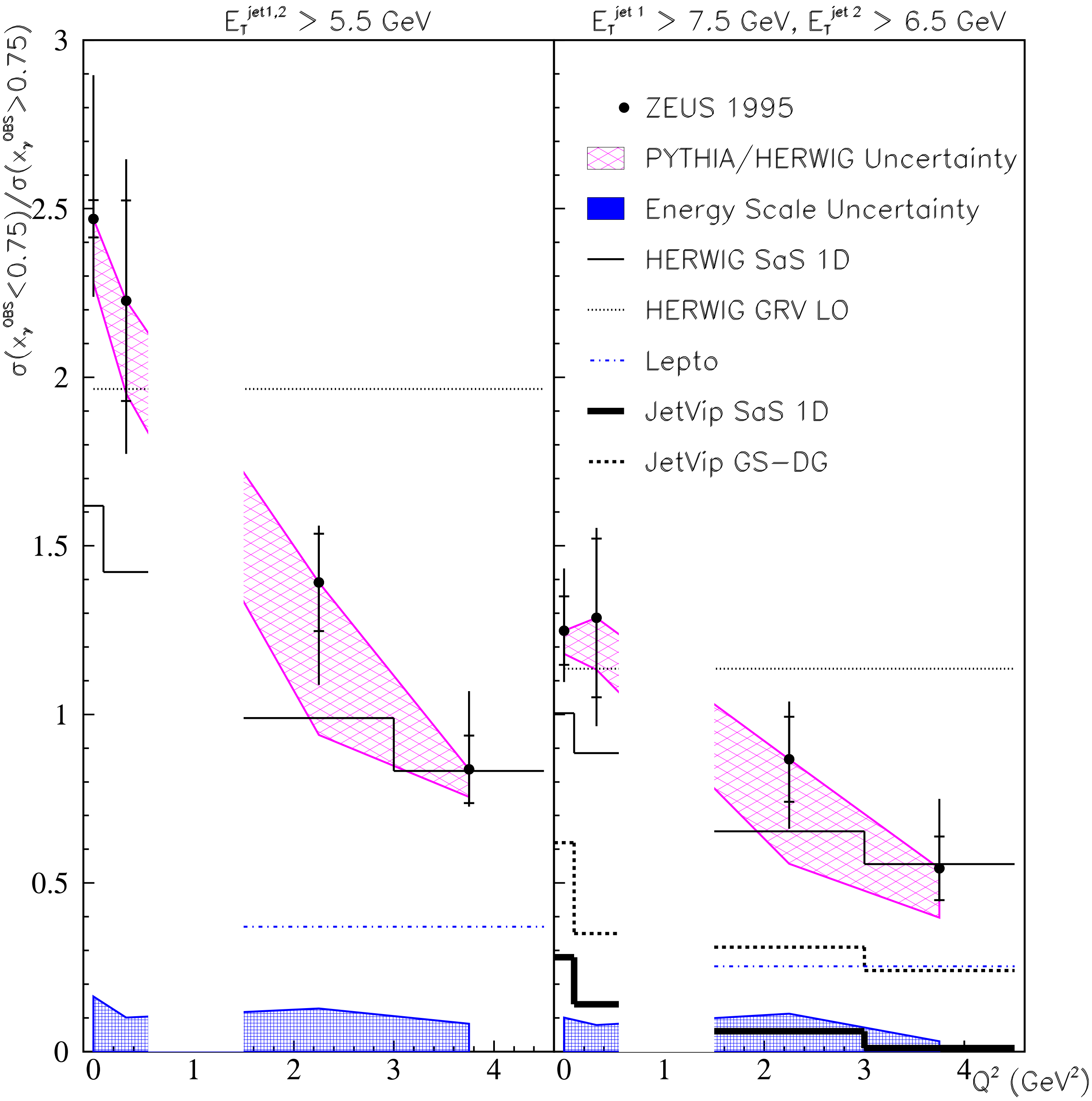
PYTHIA MC study on prompt photons and 1 jet: favours intrinsic proton and photon k_T of about 1.5 GeV at ZEUS

Photon Remnant Properties





Resolved/Direct vs Q^2



- Sizeable resolved component even at Q^2 = 4 GeV^2
- No single model/ PDF descxribes the data
- NLO calculation fails

Resolved/Direct vs Q^2: 2 scales