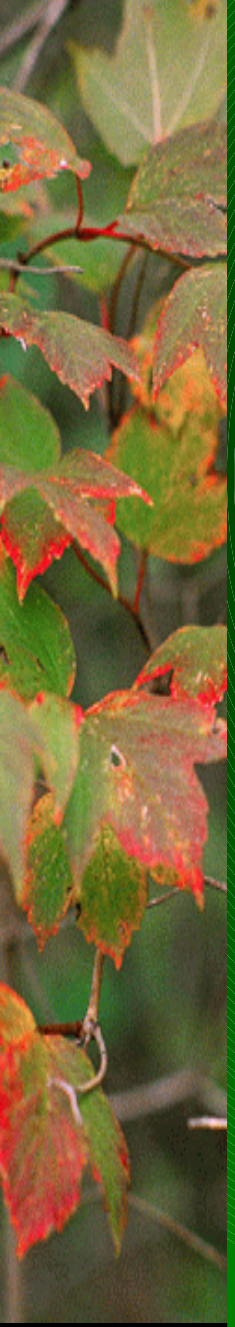


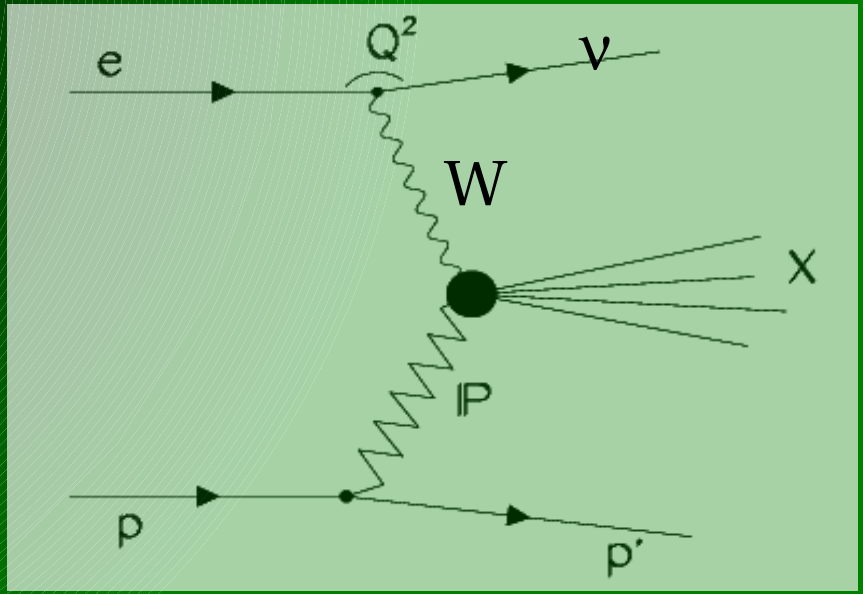
"Diffractive" Charge Current: Events with Large Rapidity Gap

L.Adamczyk, S. Hoppe, J. Rautenberg, ***K. Wichmann***

- Introduction
- ICHEP04 Status
- Outlook

Diffractive Charge Current

- Interesting process to study
- So far measured at HERA from one event by ZEUS in 1995
- Possible testing factorisation – comparison of ratios for diffractive CC & NC
- High Q^2 diffractive events connected with diffractive Higgs production at LHC



ICHEP04 Paper

- ZEUS (Prel.) 99-00 diffractive CC cross section:

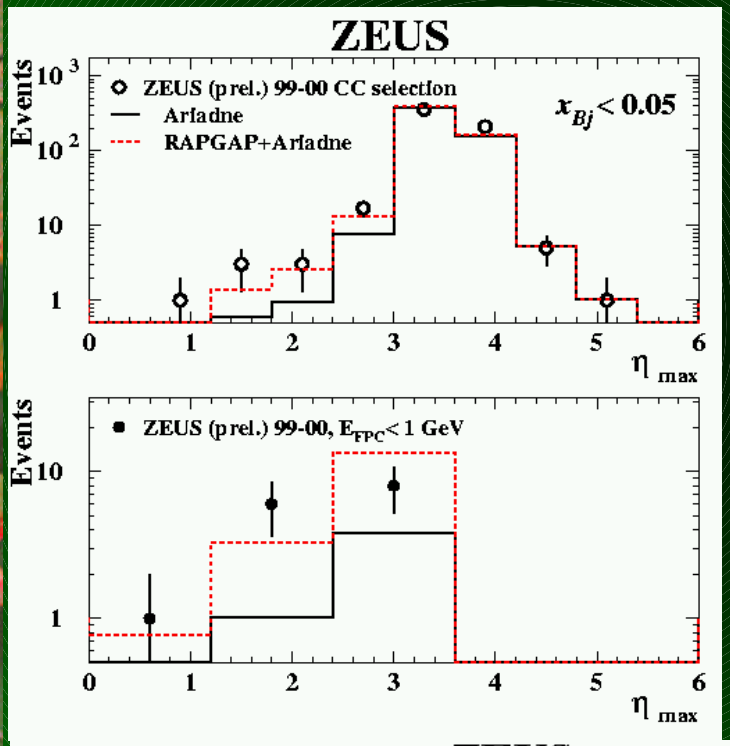
$\sigma^{CC\ DIFF}$ (Q^2>200 GeV^2, x_{pom}<0.05) = **0.49** ±0.2 (stat) ±0.13 (syst) **pb**

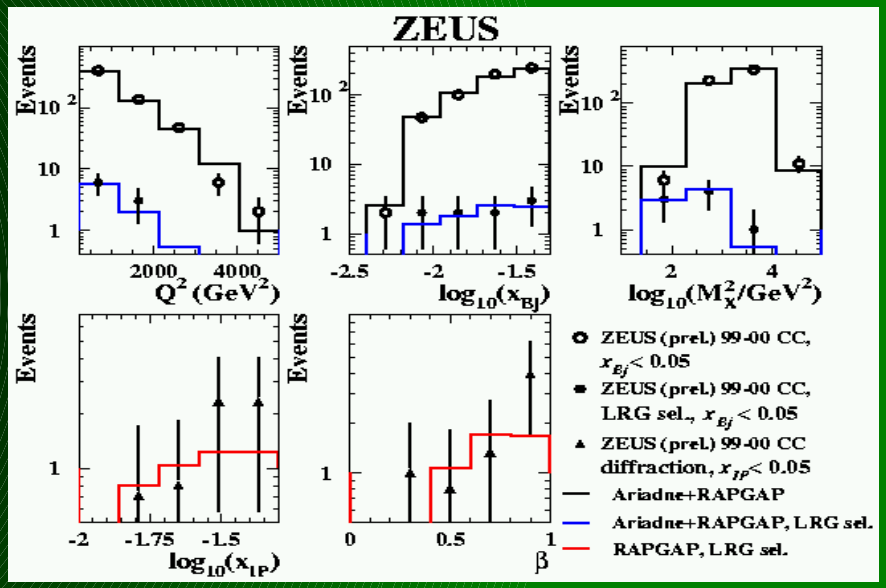
- in good agreement with RAPGAP: 0.4 pb
- ratio:

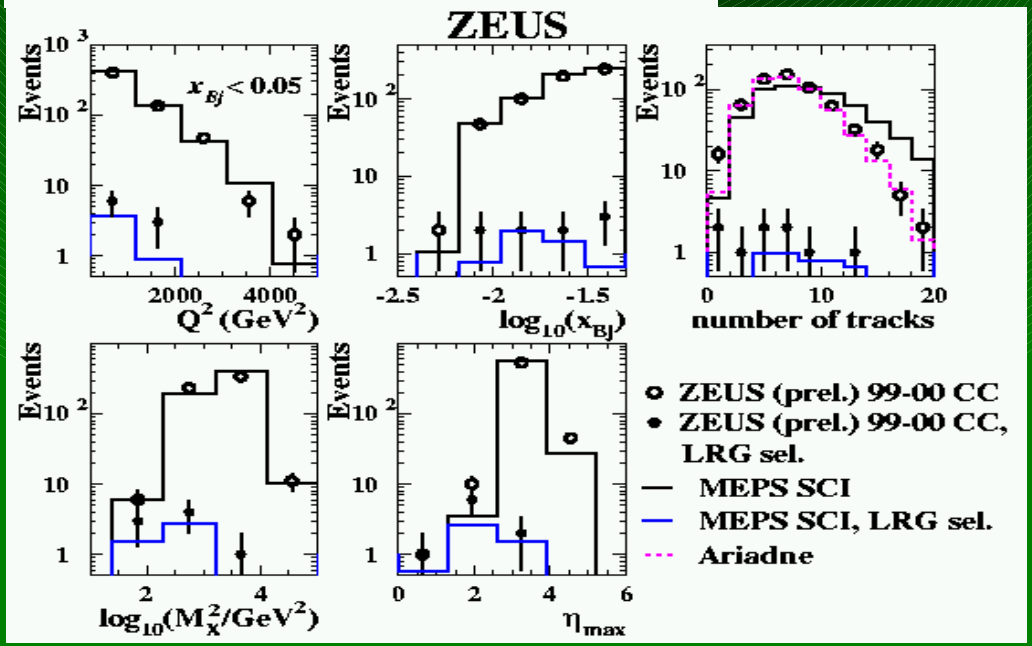
$\sigma^{CC\ DIFF}/\sigma^{CC\ Tot}$ (Q^2>200 GeV^2, x<0.05) = **2.9** ±1.2 (stat) ±0.8 (syst) **%**

- number of data events: 9
- number of expected diffractive events from RAPGAP: 5.6 ± 0.7
- number of expected background events from Ariadne and GRAPE: 2.1± 0.4
- number of expected MEPS SCI events: 3.9 +1. -0.7

ICHEP04 Paper







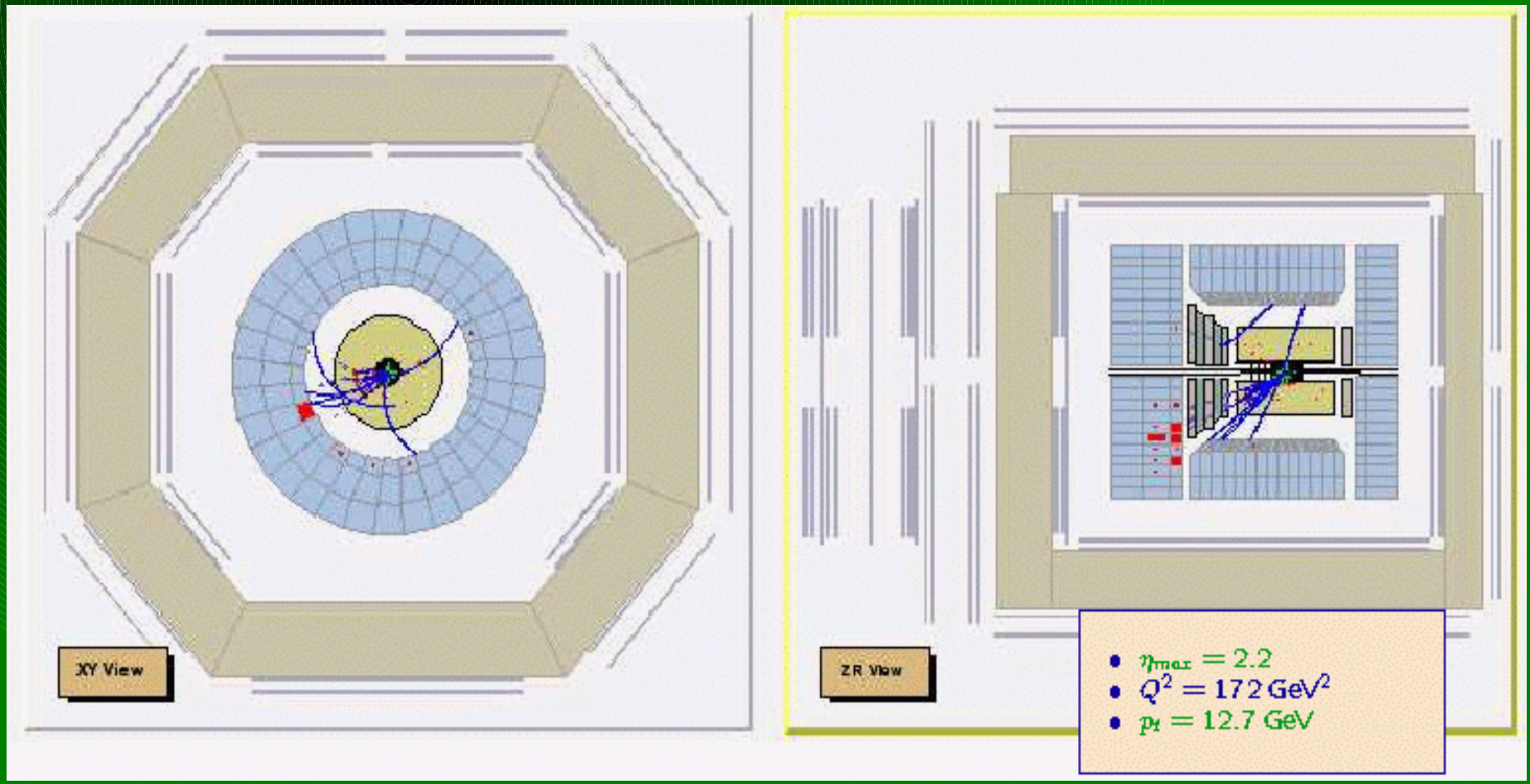
- M_X range: **5-300 GeV**
- x_{IP} range: **0.015 – 0.05** (cut)
- **β range: 0.3 - 1**

Outlook

- For final results still some work needed
- More statistics necessary:
  - **lower Q^2 and p_T cuts**
  - use special "diffractive CC" trigger (reported previously by LA)
  - **include 96-97 data**
- Interesting to compare results for **diffractive** CC and **NC** – factorisation testing
- Improving results with **HERAII data**
  - $L = 750\ pb^{-1}$, $\sigma = 0.5$ pb, efficiency = ~23% → expected ~90 events (with these selection cuts!)
  - measure polarization and electron/positron effect

Gaining events for 99-00

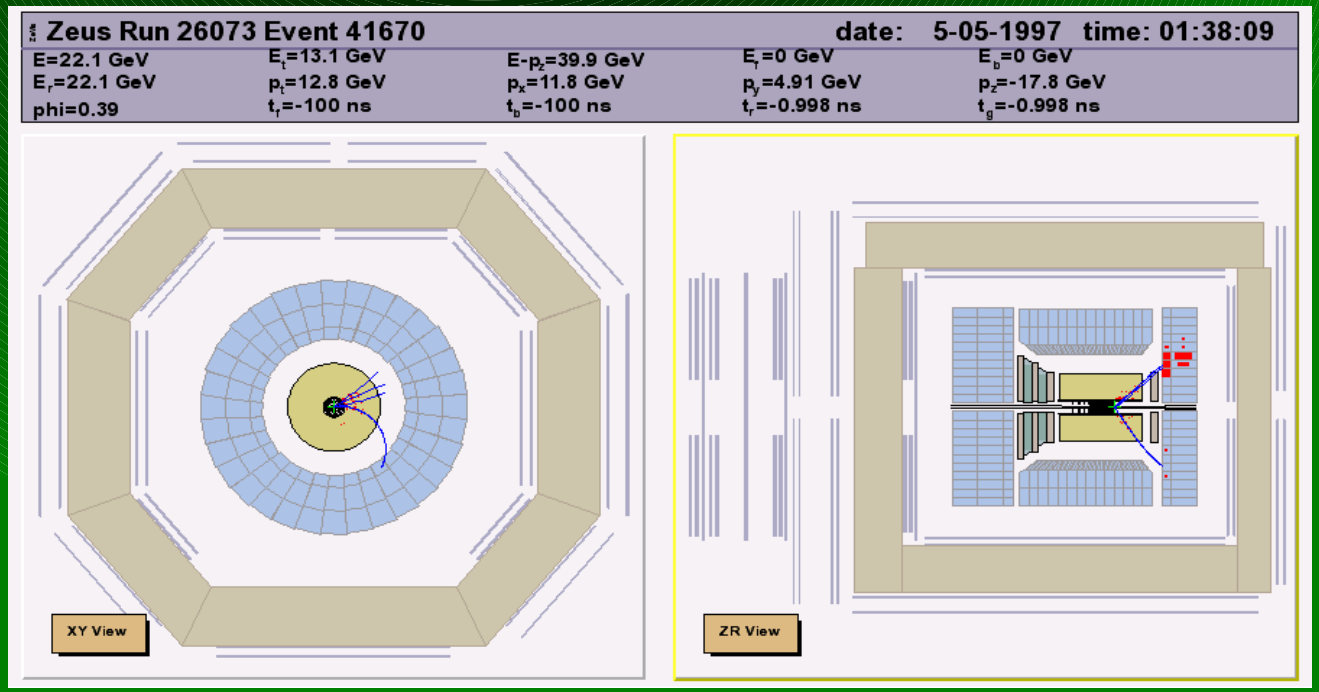
- 99-00 data, DST34, studies of new cuts to gain LRG CC events (lower Q^2 and p_T cuts as well) and keep PhP under control
- good chance for increasing the statistics by a factor of about 2



96-97 CC data: 38.6 pb^{-1}

- **Main cuts:**
  - standard CC selection

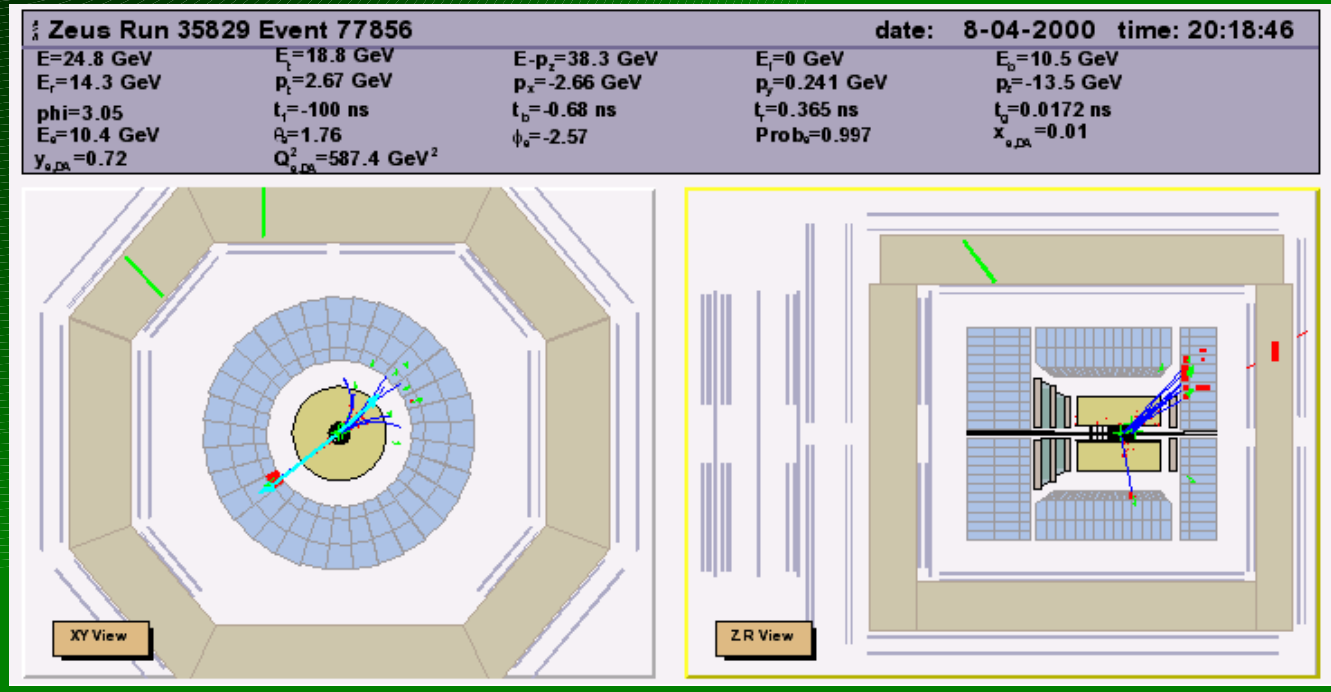
    $Q^2 > 200$ GeV2, $p_T > 12$ GeV ($p_T^{IR} > 10$ GeV)
- LRG selection:
  - $\eta_{max} > 2.9$ (as before)
  - PRT tag (instead of FPC for 99-00)



$\eta_{max} = -0.65$

First Look into NC Data 99-00 (~60 pb^{-1})

- CC selection:
  - **$Q^2 > 200\ GeV^2$**
  - **$y < 0.95$**
- LRG selection like for diffractive CC 99-00:
  - $\eta_{max} < 2.9$
  - $E_{FPC} < 1\ GeV$



Summary & Outlook

- Diffractive CC cross section measured for $Q^2 > 200\ GeV^2$ (ICHEP04 Paper)
- Study to increase statistics ongoing
  - LRG CC with lower Q^2 and p_T thresholds
  - LRG CC 96-97 with PRT
- First steps to compare LRG CC and NC taken