

# $D^*$ and Jets in Photoproduction

Zlatka Staykova

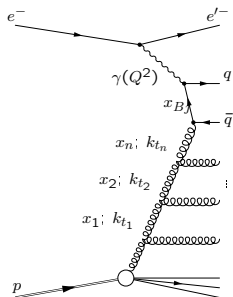
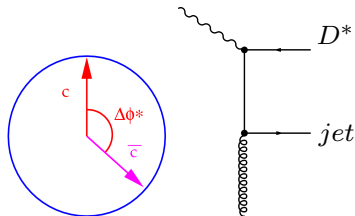
FH1

Smallx Lund-DESY meeting  
12th October 2009  
Hamburg



# Motivation and Goal of the Analysis

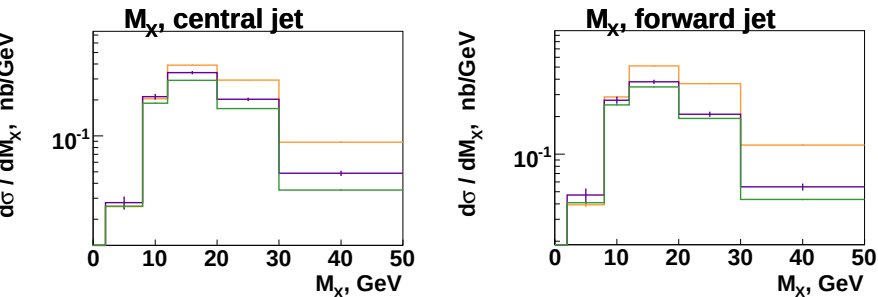
- ▶ Photoproduction of charm events– a good ground for testing pQCD and parton evolution models
- ▶  $\Delta\varphi$  in large  $\Delta\eta \longrightarrow$  enough phase space for emissions
- ▶  $M_x^2 = (p + q - (p_{j1} + p_{j2}))^2$   
the invariant mass of the remnant– large values, higher order emissions



# Phase Space Definitions

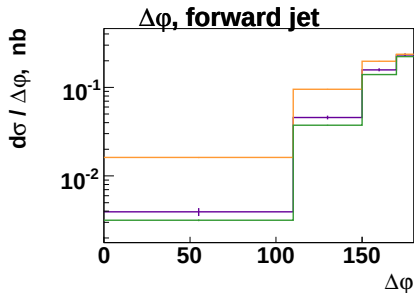
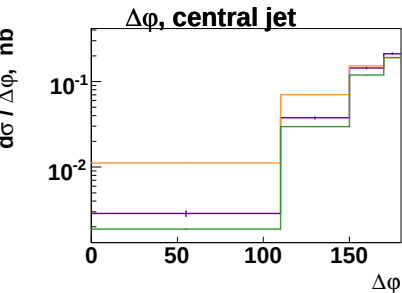
- ▶ Untagged photoproduction,  $Q^2 < 2 \text{ GeV}$  and  $0.1 < y_h < 0.8$
- ▶  $D^*$  selection:
  - ▶  $p_t(D^*) > 1.8 \text{ GeV}$  and  $|\eta(D^*)| < 1.5$
- ▶ Jet selection:
  - ▶  $D^*$  was treated as a leading particle
  - ▶  $k_T$  clustering algorithm, FastJet package was used,  $R = 1$ ,  $p_t^{\min} = 1. \text{ GeV}$
  - ▶  $p_t > 3.5 \text{ GeV}$  and  $|\eta(D_{\text{jet}}^*)| < 1.5$
  - ▶ two samples for the second jet,  $|\eta(\text{Other}_{\text{jet}})| < 1.5$  referred as central and  $-1.5 < \eta(\text{Other}_{\text{jet}}) < 2.9$  referred as forward

# The Invariant Mass of the Remnant $M_X$



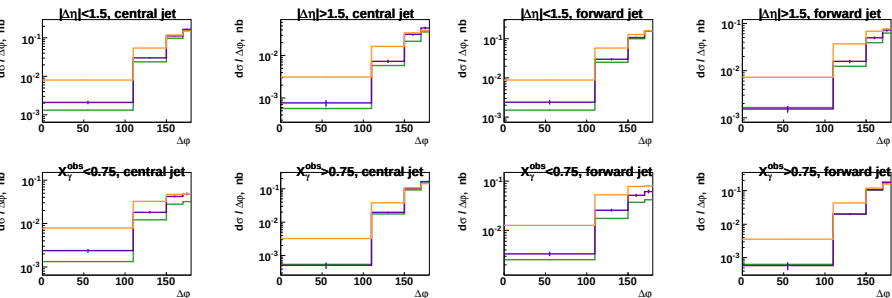
- Orange– Cascade, Purple– Pythia all inclusive, Green– Pythia Direct charm

$$\Delta\varphi(D_{\text{jet}}^* - \text{Other}_{\text{jet}})$$



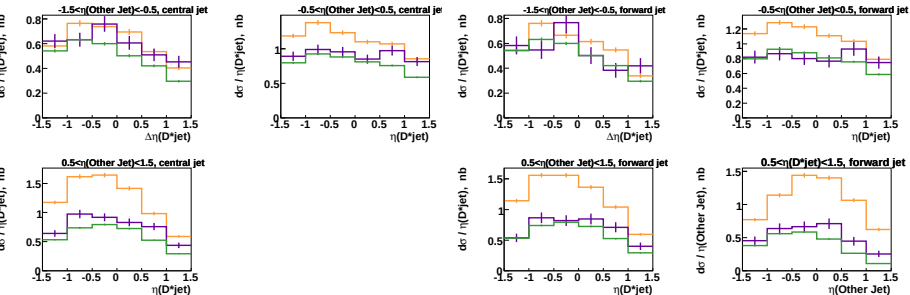
- Orange– Cascade, Purple– Pythia all inclusive, Green– Pythia Direct charm

# $\Delta\varphi(D_{\text{jet}}^* - \text{Other}_{\text{jet}})$ Differential in $\Delta\eta$ and $X_\gamma$



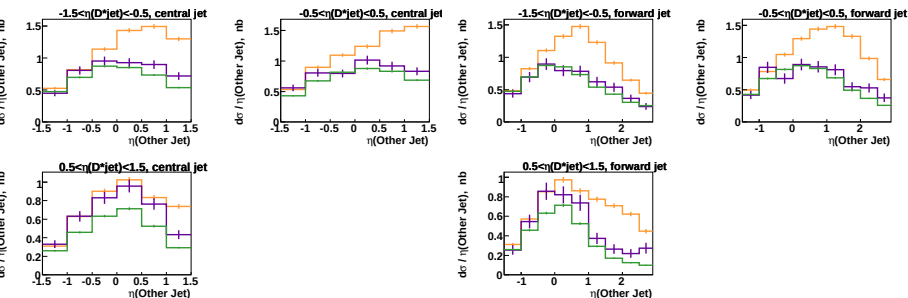
► Orange– Cascade, Purple– Pythia all inclusive, Green– Pythia Direct charm

# $\eta(D_{\text{jet}}^*)$ in bins of $\eta(\text{Other}_{\text{jet}})$



► Orange– Cascade, Purple– Pythia all inclusive, Green– Pythia Direct charm

# $\eta(\text{Other}_{\text{jet}})$ in bins of $\eta(D_{\text{jet}}^*)$



► Orange– Cascade, Purple– Pythia all inclusive, Green– Pythia Direct charm