Status and plans

Done:

- K^0_s and Λ selection comparison (A. vs Ch.) for 00 DIS sample $\Rightarrow$ both codes agree ($\sim$0.5% discreapancy due to E- p_z cut)
- $5*10$^6 MC (djangoh14) simulated events with K^0_s and Λ preselection (cuts: $|\eta(V^0)|<1.7$, $p_T(V^0)>0.1$ GeV) for detector corrections

Plans:

- finish comparison $\Rightarrow$ conclusions from comparing events list for 99 , 96/97 and distributions of $N(\Lambda)$ and $N(K^0_s)$ from fits in η, p_T, x and Q^2
- compare trigger efficiencies in data and MC for S61
- calculate efficiencies and correction factors, resolutions, purities, stabilities

Determination of F_2^s ?

$$\frac{d\sigma_j}{dp_{Tj}\,d\eta_j} \Leftrightarrow pdf$$

Jet distributions constrain parton density function

$$\frac{d\sigma_j^{K_0}(p_{Tj},\eta_j,x_{K_0})}{dp_{Tj}\,d\eta_j\,dx_{K_0}} = \sum_p \frac{d\sigma_j^p(p_{Tj},\eta_j)}{dp_{Tj}\,d\eta_j} D_p^{K_0}(x_{K_0},p_{Tj}) \qquad x_{K_0} = \frac{\vec{p}_{K_0} \bullet \vec{p}_j}{\left|\vec{p}_j\right|^2}$$

Sum over parton flavours

Normalized K_0 momentum along jet

Jet distributions together with associated K_0's constrain jet flavours and one may attempt use them to constain strange parton density function

•First step : use MC (e.g. RAPGAP,CASCADE) fragmentation functions and jet distributions and check if jet distributions associated with K_0's are indeed sensitive to strange quark jet content determine what kind of of distributions give best constraints

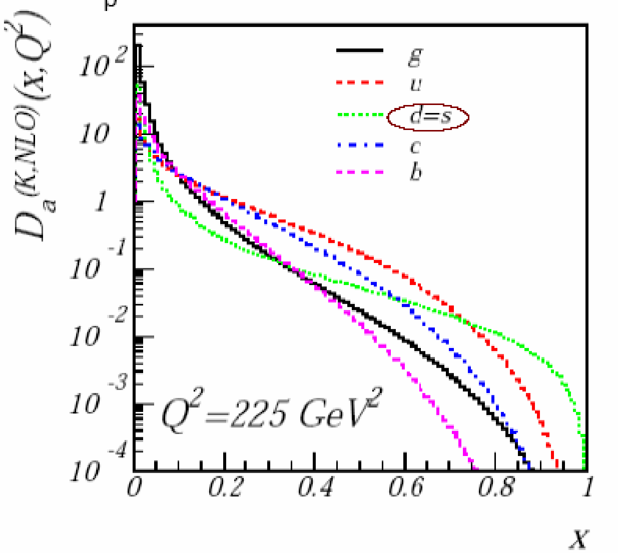
•Second step (probably beyond Pawel diploma th.) fit PDF to inclusive x-section + dijet x-section + dijet-K_0 constraining strange component (tool needed), determine what kind of of distributions give best constraints

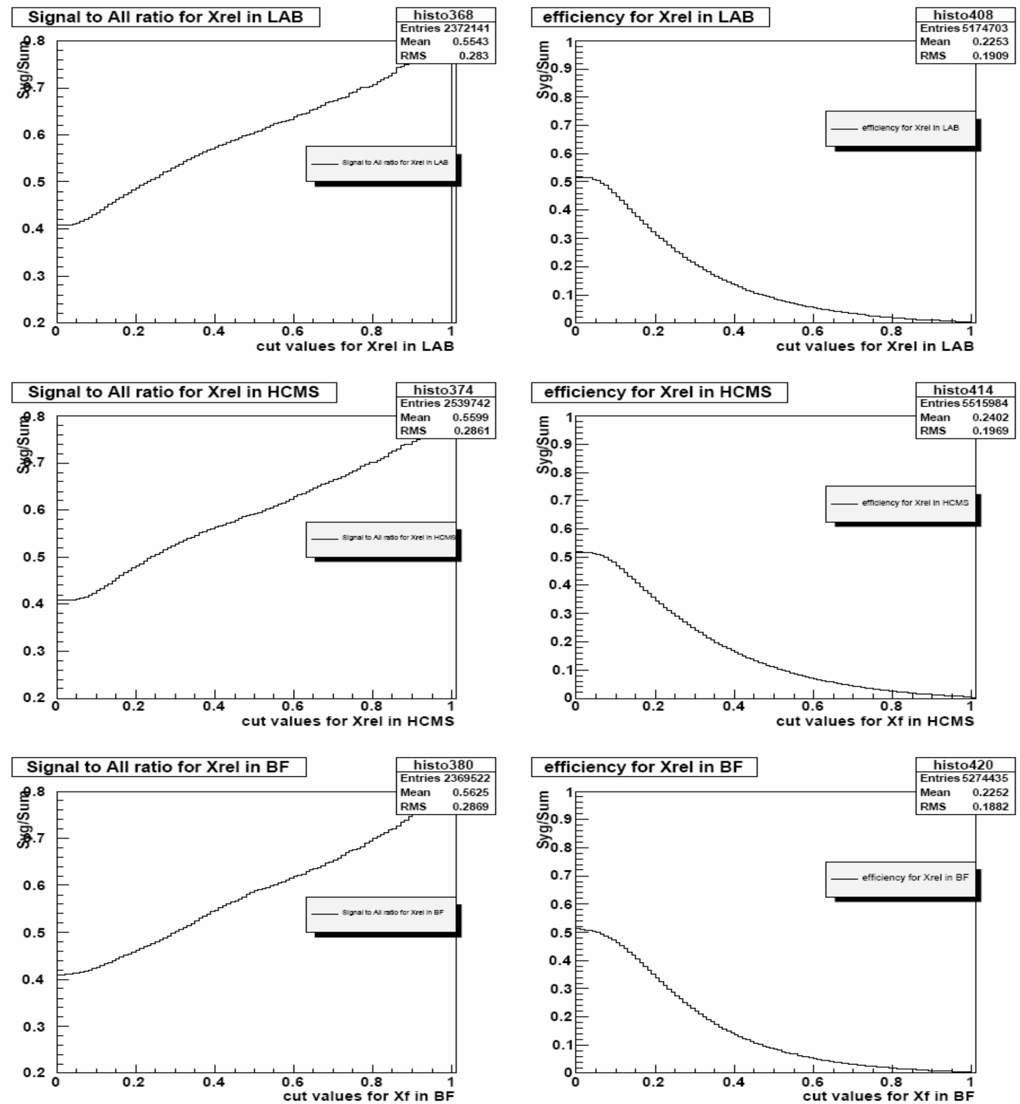
First step: FF from MC (lund string fragmentation) vs. NLO FF, parametrize as a function of λ_s,scale (jet p_T)

- Use jet+K0 data to determine FF(parton→K_0+X)(x_{K0})

Question: what is relation of such FF to NLO FF

D^h_p = next to leading order





• using MC (e.g. RAPGAP produce table of jet x-sections with errors in bins $\Delta\eta$, Δp_T for each flavour for different processes (PM,BGF,QCDC)

•From table of „flauvored jets" and table of FF construct χ^2:

Data : jet x-section

jet+K_0 x-section

x_{rel} of K_0 distribution

Given : FF→K_0 for all flavours parametrized as a function of λ_s

tables of jet x-sections (shapes) for all flavours

Parameters: normalisation constants for flavours; λ_s

Fit will be sensitive to relative weights of those flavours which FF strongly differ, e.g. s+d, other quarks, gluons

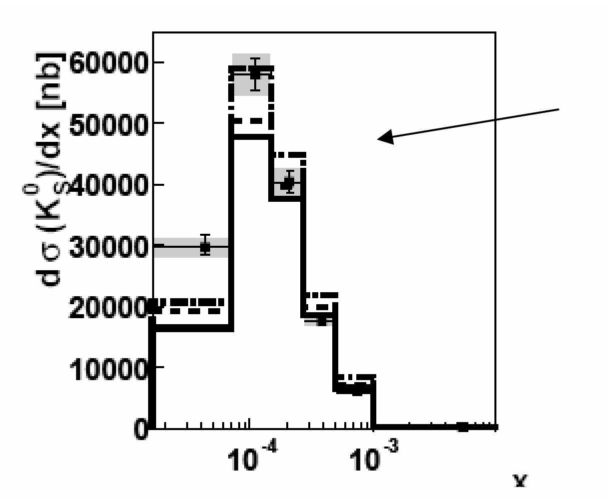
Dijet data with 2 K_0 should be sensitive to BGF/QCDC FF(q)*FF(g) much different from FF(q)FF(q)

•NLO (e.g.NLOJET++) + NLO FF ? Tool missing (?)

	H1-Daten	MEPS ($\lambda_s = 0.3$)	MEPS ($\lambda_S = 0.2$)	CCFM ($\lambda_S = 0.2$)
$\sigma_{vis}(K^0_S)$[nb]	$20.25 \pm 0.10 \pm 1.47$	24.4	20.2	18.2
$\sigma_{vis}(\Lambda(\bar{\Lambda}))$[nb]	$6.96 \pm 0.09^{+0.64}_{-0.56}$	8.05	6.29	5.96
$\sigma_{vis}(\Lambda)$[nb]	$3.44 \pm 0.06^{+0.31}_{-0.28}$	4.01	3.14	3.00
$\sigma_{vis}(\bar{\Lambda})$[nb]	$3.53 \pm 0.06^{+0.32}_{-0.28}$	4.04	3.15	2.96
$\sigma(\Lambda(\bar{\Lambda})/\sigma(K^0_S)$	0.344 ± 0.004	0.330	0.311	0.328
$\sigma(\Lambda)/\sigma(\bar{\Lambda})$	0.98 ± 0.02	0.99	1.00	0.99

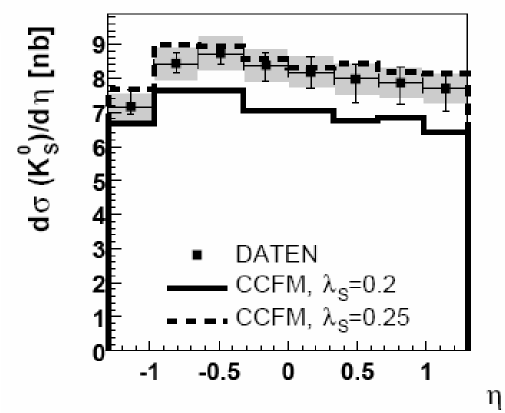
	H1-Daten	CDM ($\lambda_S = 0.2$)	HERWIG
$\sigma_{vis}(K^0_S)$[nb]	$20.25 \pm 0.10 \pm 1.47$	19.21	22.15
$\sigma_{vis}(\Lambda(\bar{\Lambda}))$[nb]	$6.96 \pm 0.09^{+0.64}_{-0.56}$	6.23	20.6
$\sigma_{vis}(\Lambda)$[nb]	$3.44 \pm 0.06^{+0.31}_{-0.28}$	3.32	10.38
$\sigma_{vis}(\bar{\Lambda})$[nb]	$3.53 \pm 0.06^{+0.32}_{-0.28}$	3.31	10.22
$\sigma(\Lambda(\bar{\Lambda})/\sigma(K^0_S)$	0.344 ± 0.004	0.324	0.930
$\sigma(\Lambda)/\sigma(\bar{\Lambda})$	0.98 ± 0.02	1.00	1.02

Tabelle 9.1: Die totalen, inklusiven sichtbaren Wirkungsquerschnitte $\sigma_{vis}(ep \to [K^0_S, \Lambda(\bar{\Lambda}), \Lambda\bar{\Lambda}]X)$ der K^0_S- und Λ-Produktion in den Daten und in den Modellen MEPS(RAPGAP), CCFM(CASCADE), CDM(DJANGO) und HERWIG.

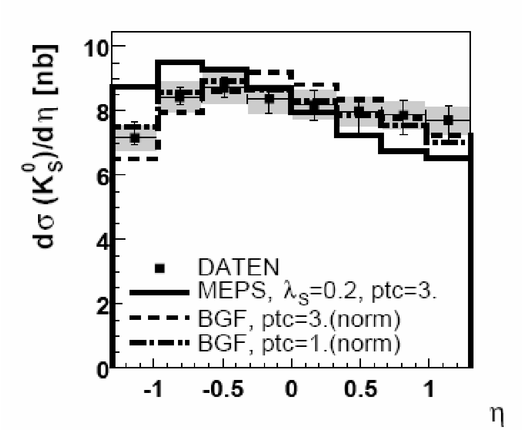


MEPS, λ_s=0.3,0.25,0.2

Apparent problem in data description, especially at low x



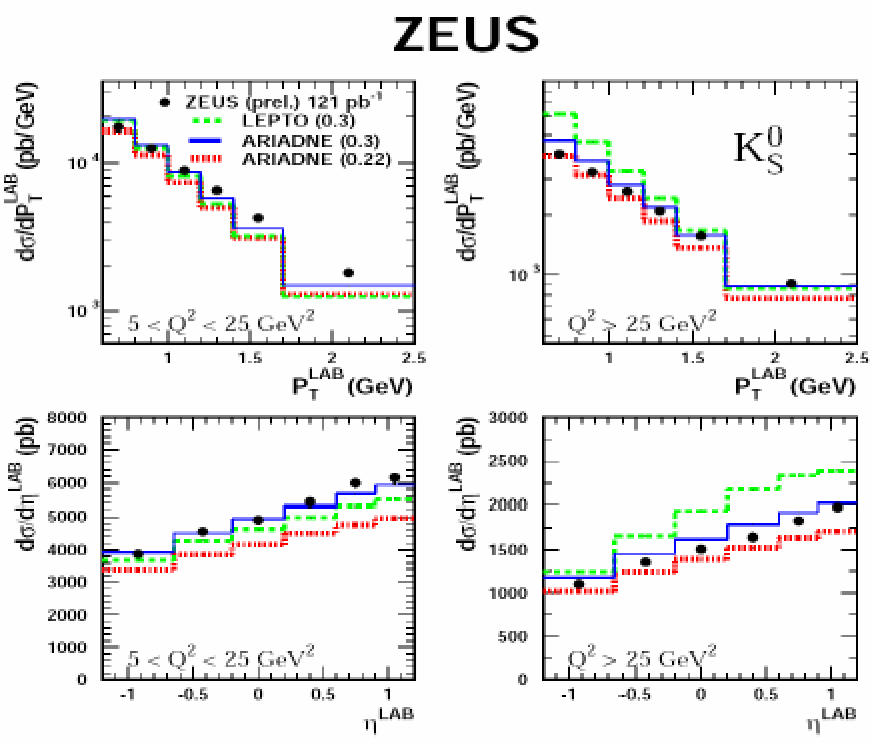
CCFM does better job, but still at λ_s=0.25 < 0.3 expected from e^+e^-



MEPS looks OK. provided that we exclude QCDC (CCFM case), always λs=0.25

Inclusive cross sections

hadronisation universal e^+e^- : $\lambda_s = 0.3$



Differential K^0_s cross section in DIS in lab frame compared with LEPTO and ARIADNE

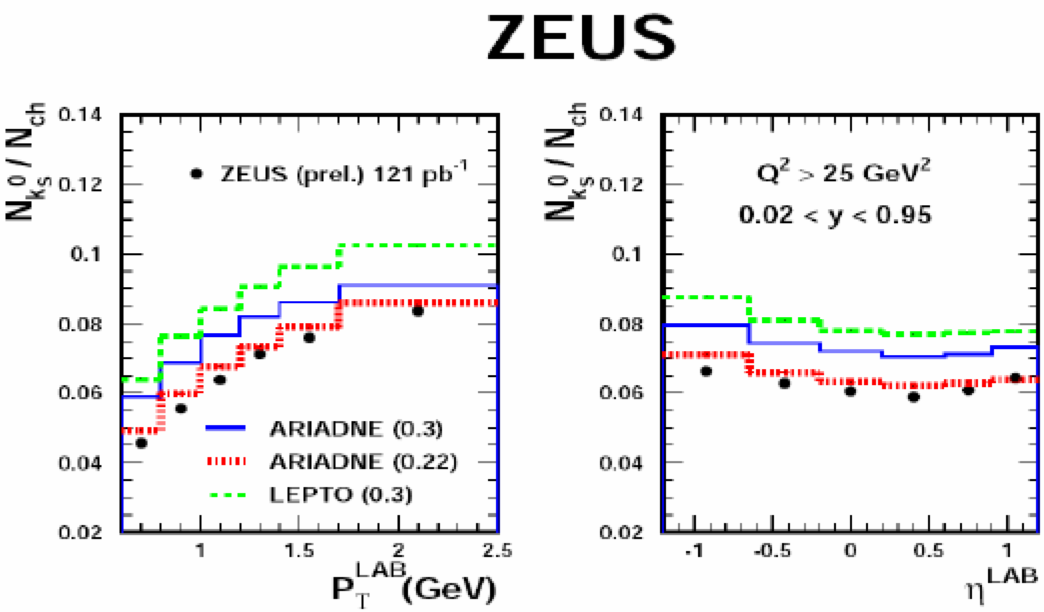
ARIADNE with $\lambda_s = 0.3$ describes data well

$\lambda_s = 0.2$ less satisfactory

LEPTO (PS+SCI) does not describe data

but... strange to light hadrons ratio

Different straneness suppresion for inclusive cross section and ratio strange to light hadrons!



N_{ch} -number of charged pions,charged kaons, protons and antiprotons

ARIADNE with λ_s=0.22 describes data best

Questions :

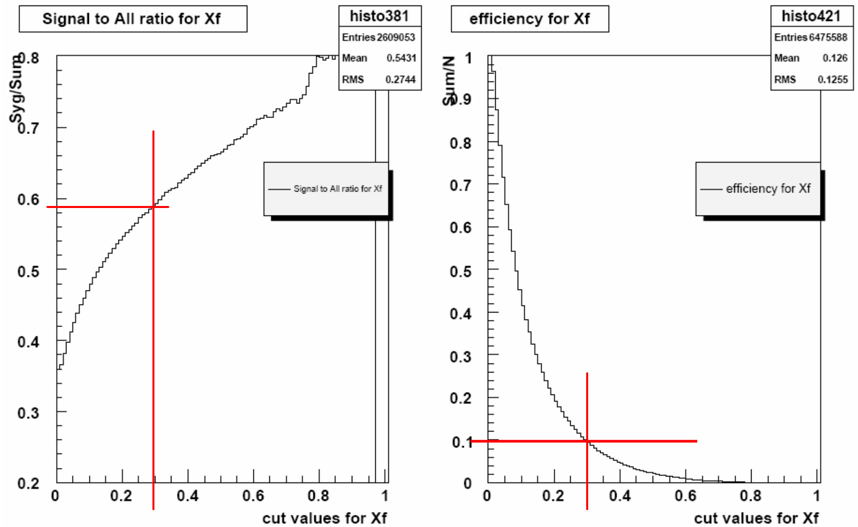
Do we have problem with universality of FF ? Unlikely, for chaqrged particle universality of FF in e^+e^- vs ep has benn proven in H1 and ZEUS

Do we have problem with strange component of pdf ?? How they are constained in fits ?→jet +$K_{0,}$, statistics ? Wait for Pawel study

Inclusive 2K_0 data: could we describe incusive K_0 +inclusive 2K_0 treating QCDC/BGF as a parameter with universal λ_s=0.3 → if yes we could conclude that it is rather strange quark see problem then FF problem

Global variables: X_f and X_p

X_f



X_p