Hard single diffraction study
pp -> p 2j X
(with POMWIG1.2 + FAMOS1.4.0)

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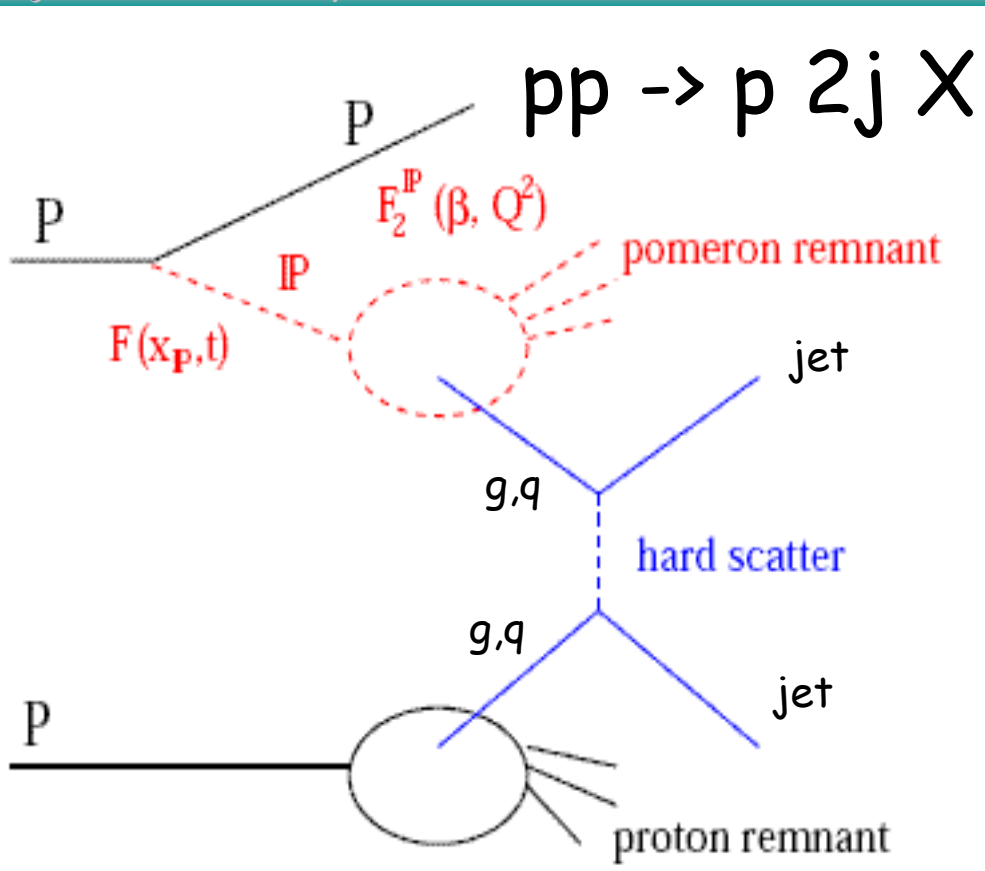
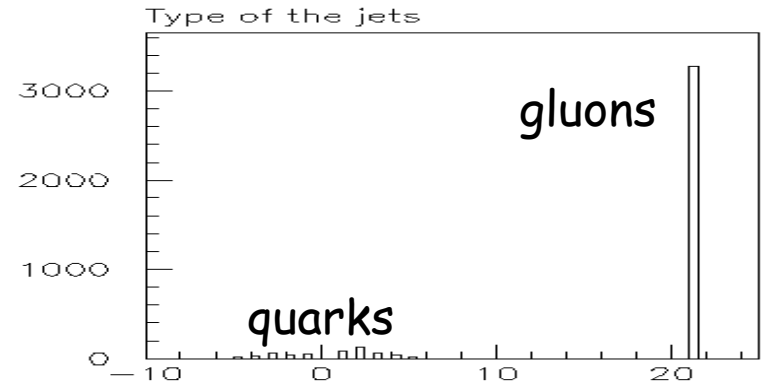
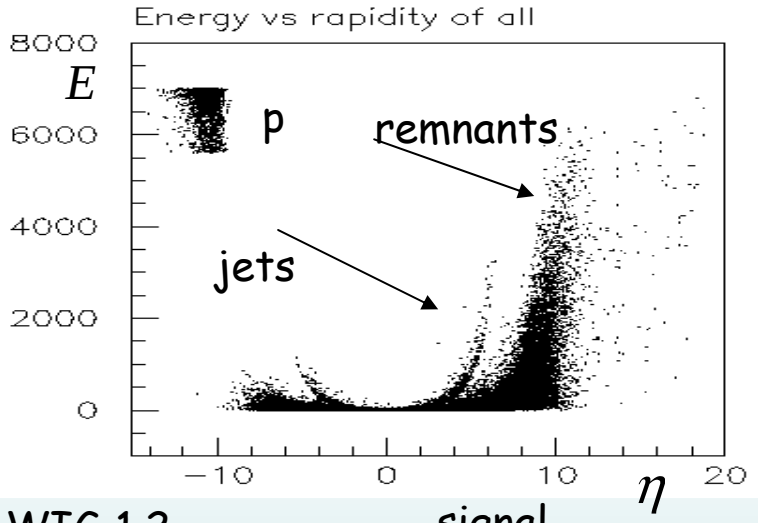
Subject of study







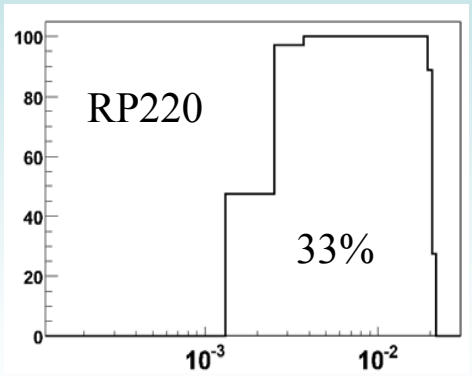
$\sigma_{HSD} = 1.7mb$ HSD 2 jets prod. / POMWIG 1.2 signal

$\sigma_{ND} = 6.2mb$ Non-diffractive 2 jets prod./ HERWIG 6.5 background

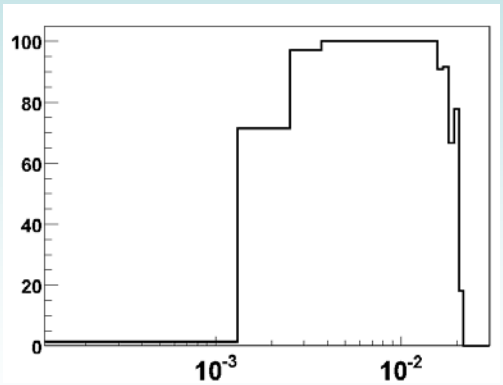
The process is noted by 2 jets and rapidity gap between outgoing proton and other products of the reaction. These 2 features can be used for effective suppression of the non-diffractive jets production

RPs acceptances: ξ (FAMOS1.4.0)

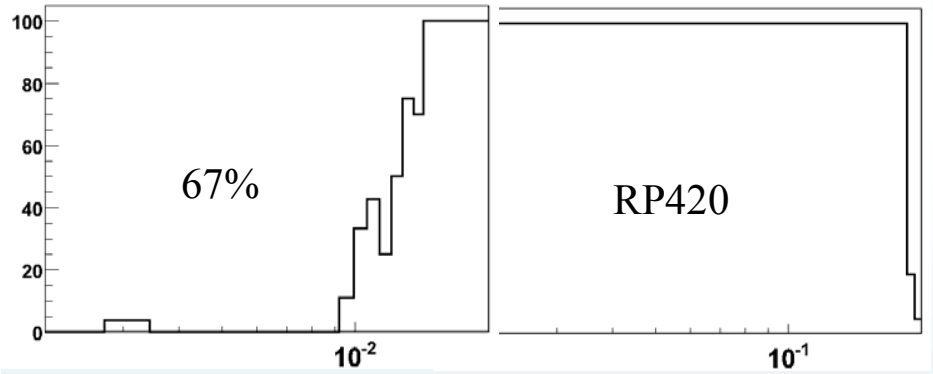
for diffractive protons produced in pp->p2jX reaction

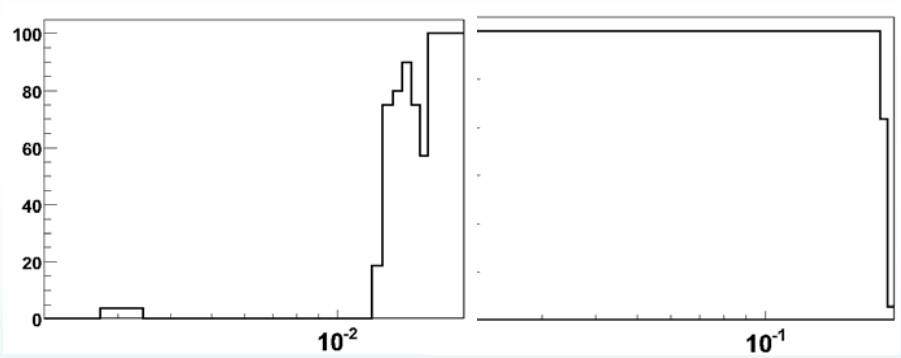


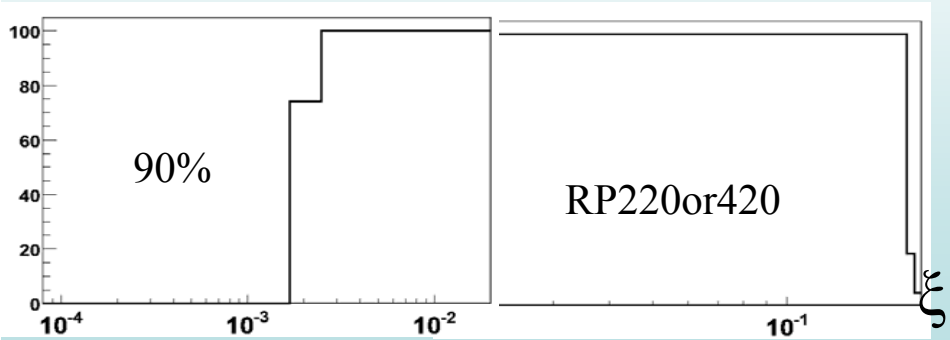
clockwise proton

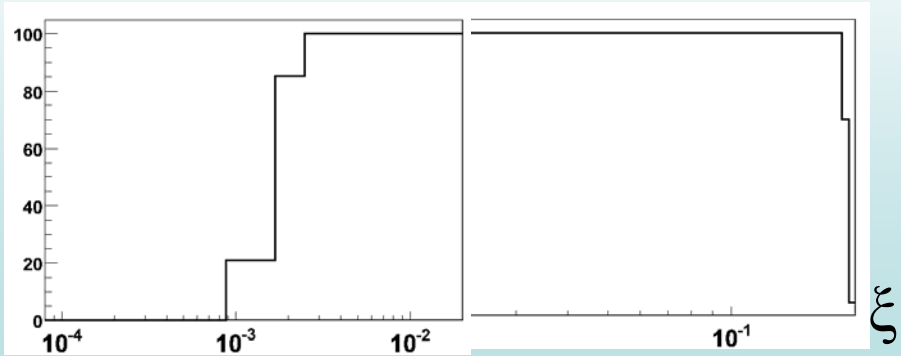


anticlockwise proton







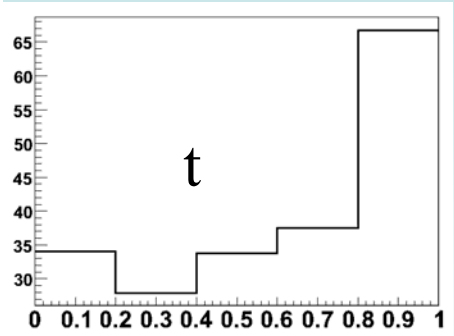


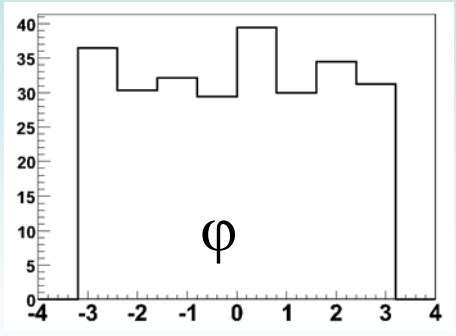
RPs acceptances: t, φ (FAMOS1.4.0)

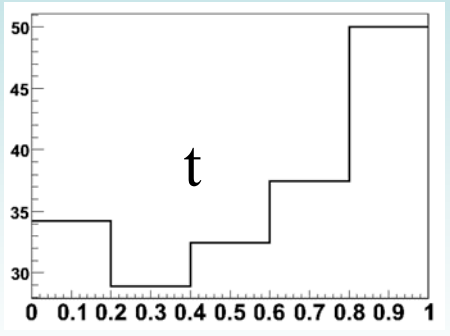
clockwise proton

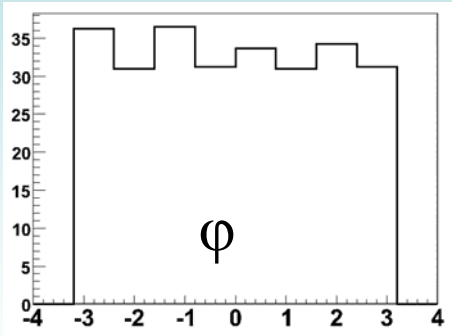
anticlockwise proton

RP220

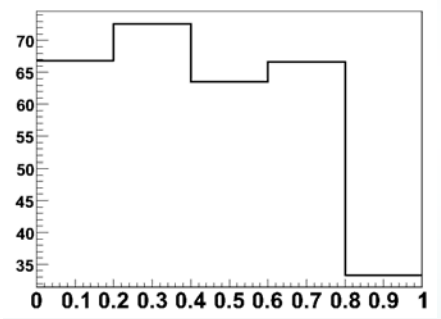


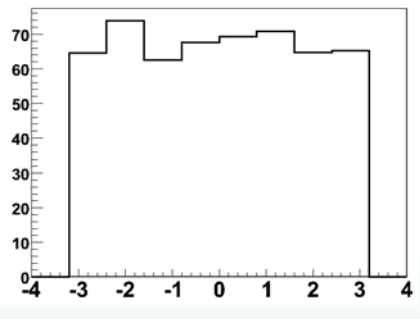


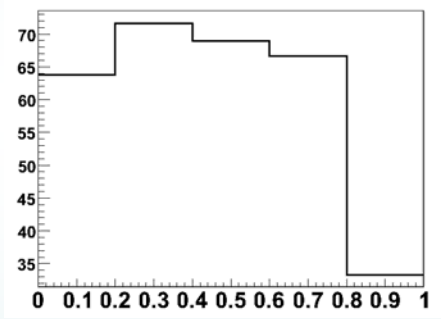


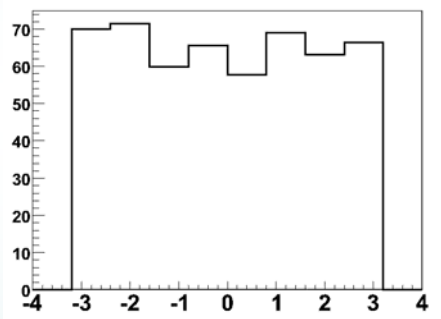


RP420

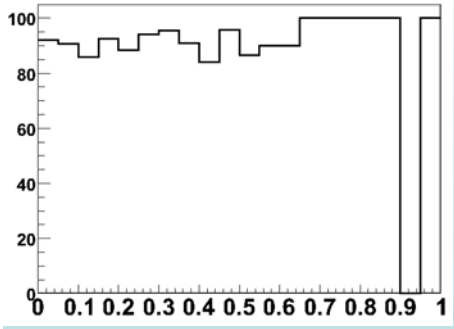


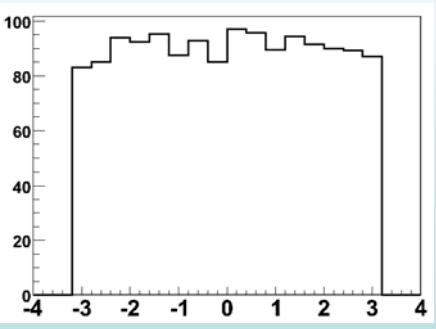


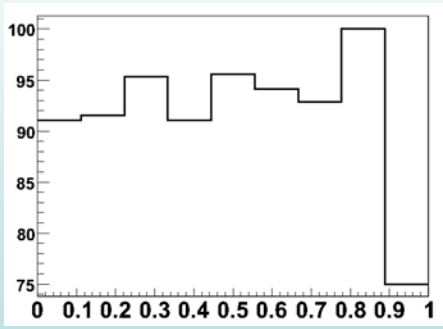


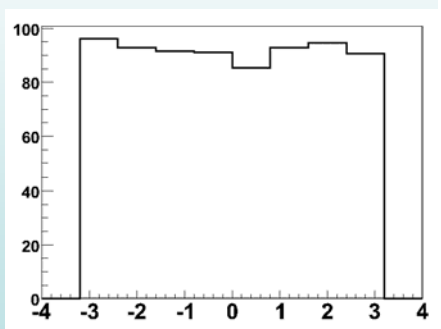


RP220or420



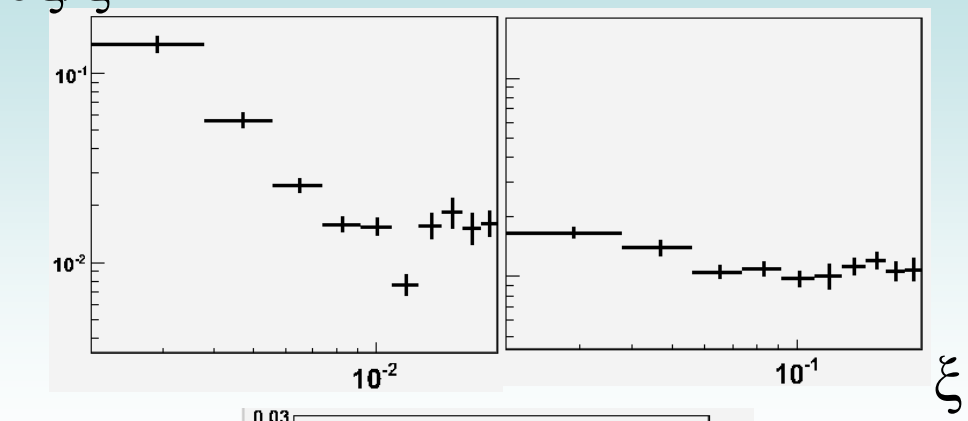


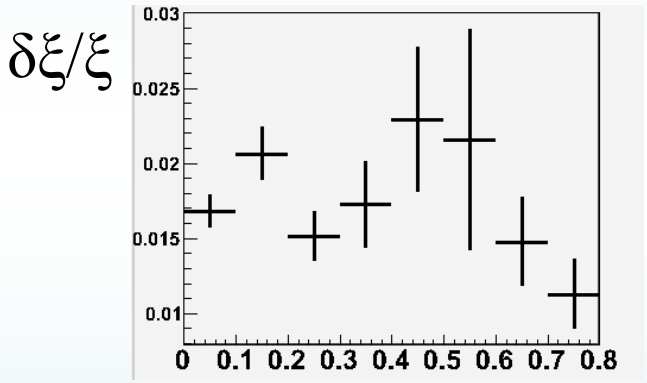


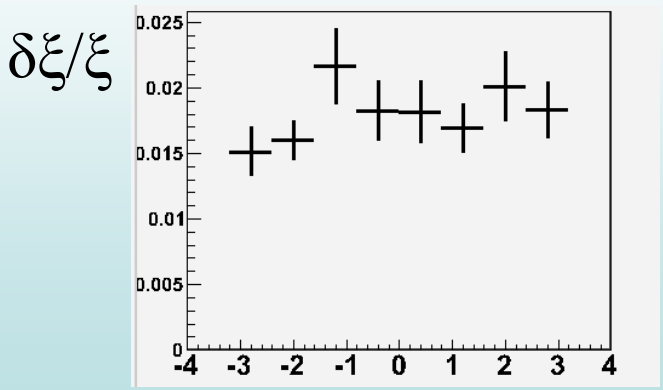


RPs resolution: δξ/ξ (FAMOS1.4.0)

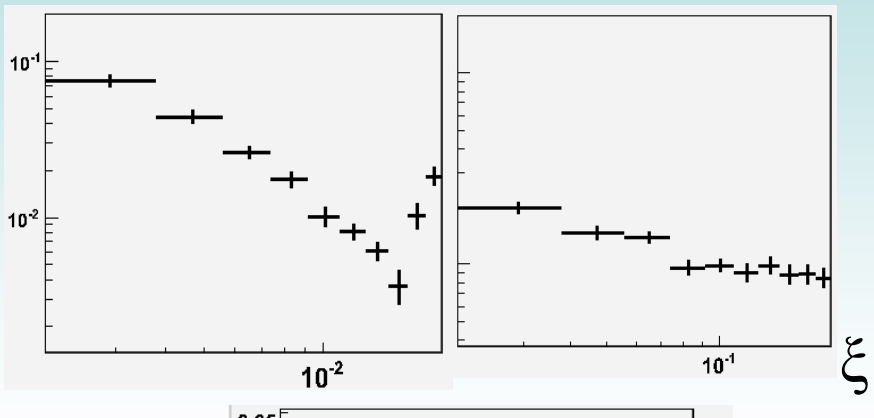
clockwise proton

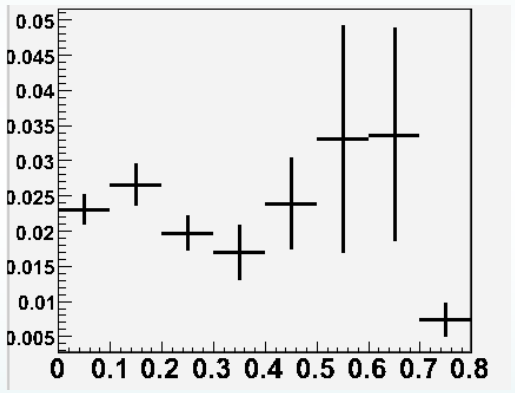


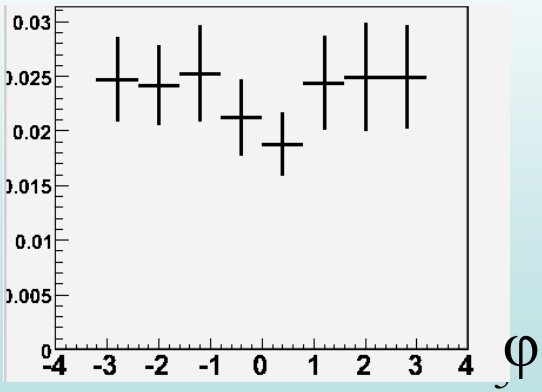




anticlockwise proton



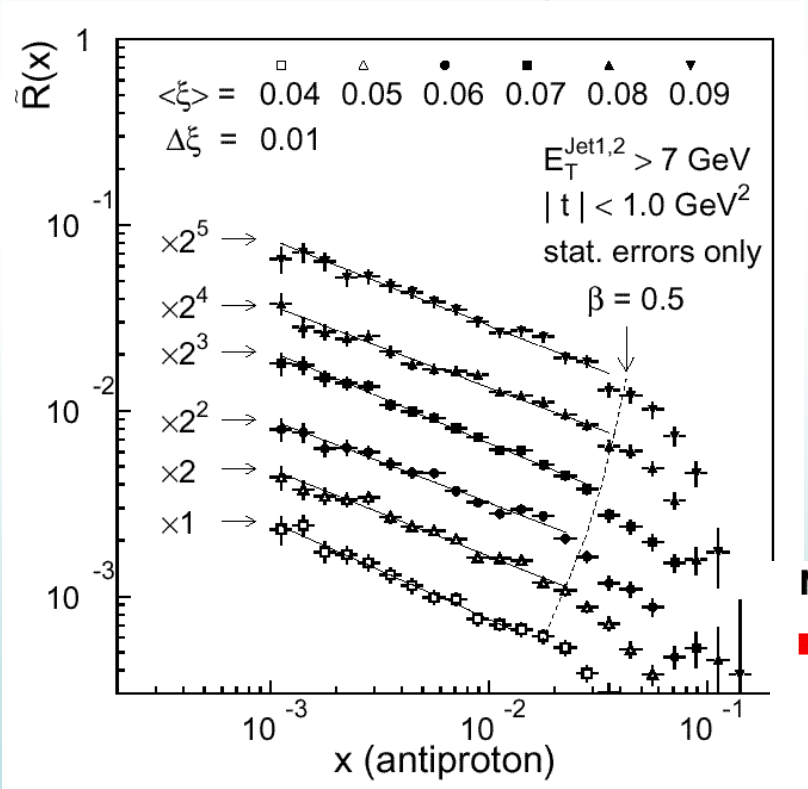


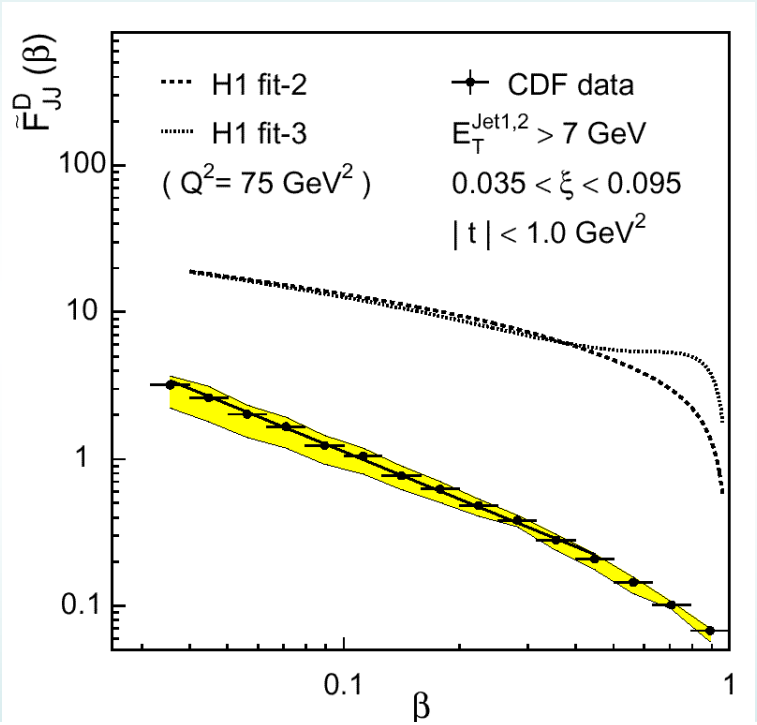


How to calculate diffractive structure function of proton with RPs

$$F = F(t, Q^2, \beta, \xi), \beta = \frac{x}{\xi}, x = x_{Bjorken} \qquad x = \frac{1}{\sqrt{s}} \sum_{jets} E_T^j e^{\eta_i}$$

In LO QCD $$R(x) = \frac{N_D^{jj}}{N_{ND}^{jj}}(x) = \frac{F_D^{jj}(x)}{F_{ND}^{jj}(x)}$$





Normalisation discrepancy (x 10)

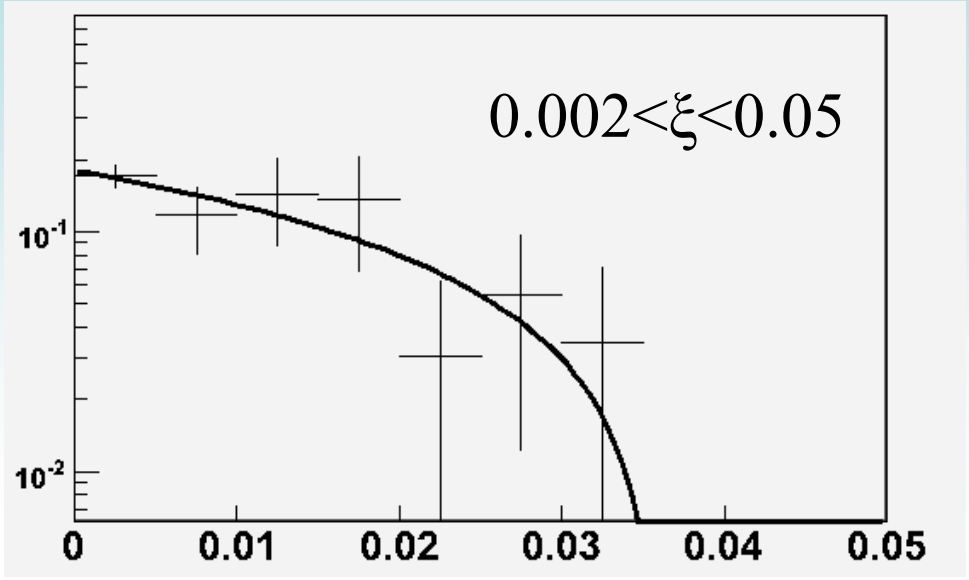
Hard scattering factorisation violated in $p\bar{p}$

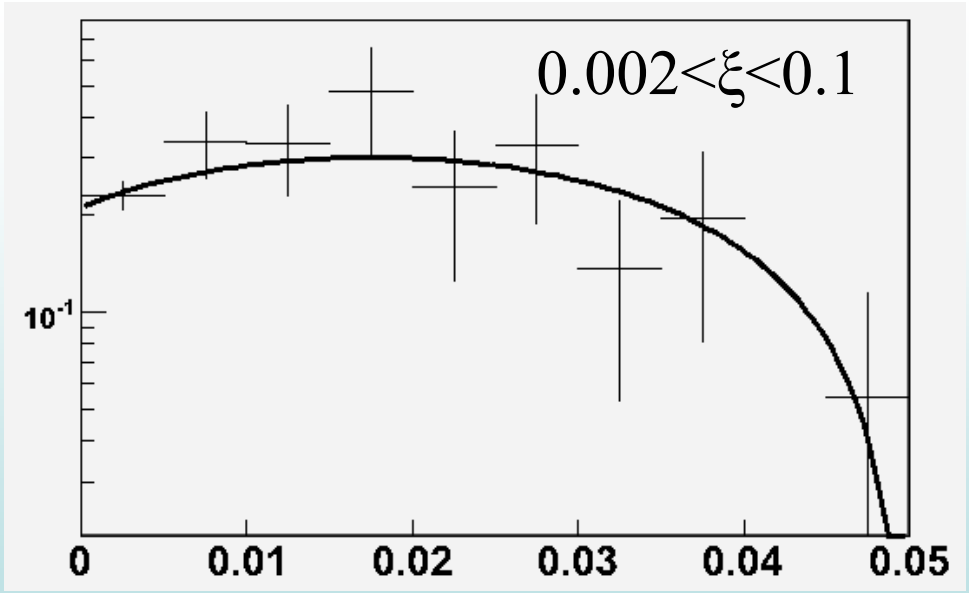
$$\sigma \sim F^D(\beta, Q^2, \xi, t) \otimes \hat{\sigma}_{jj} \otimes |S|^2$$

gap survival probability

Ratio Nsd/Nnd vs x

$\frac{N_{SD}}{N_{ND}}$





x

Et>20GeV
|t|<1 GeV^2

only stat. errors

10^-5 fb^-1