

# SHERPA: Status and prospects

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MC4LHC 2006, CERN, 17.7.2006

# Introducing SHERPA

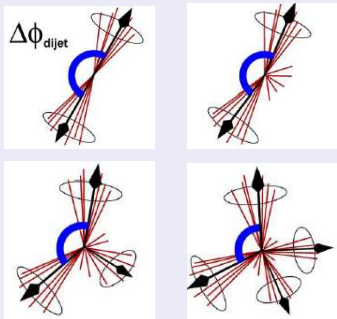
T.Gleisberg, S.Höche, F.K., A.Schälicke, S.Schumann and J.C.Winter, JHEP 0402 (2004) 056

- New event generator, written from scratch in C++.
- Matrix elements from AMEGIC, tested in SM, MSSM and ADD.
- Combined with own parton shower implementation  
(similar to shower in PYTHIA 6.2)
- Hadronization and hadron decays of Pythia interfaced
- Own  $\tau$ -decays
- Multiple interactions, similar to PYTHIA 6.2
- Tested in a number of processes (highlights see below).

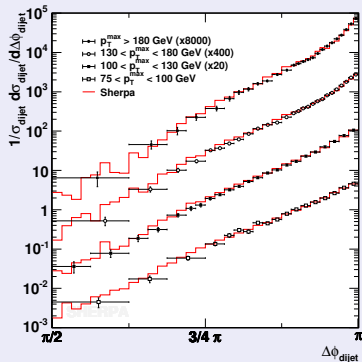
# Azimuthal decorrelations of jets at the Tevatron

## Idea

- Check QCD radiation pattern



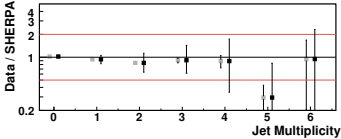
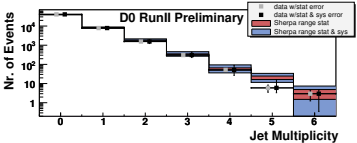
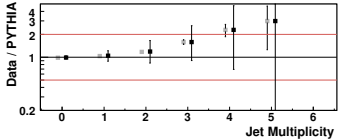
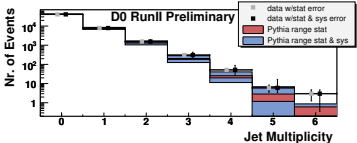
## Distributions @ Run II



# Comparison with data from Tevatron

(D0-Note 5066)

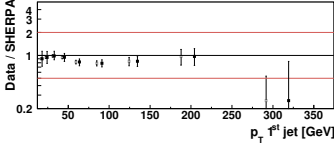
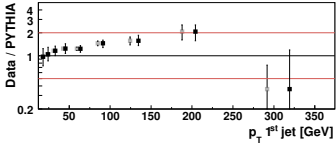
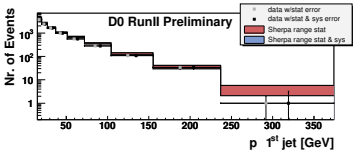
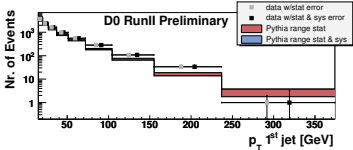
## Jet rates in $p\bar{p} \rightarrow Z + X$



# Comparison with data from Tevatron

(D0-Note 5066)

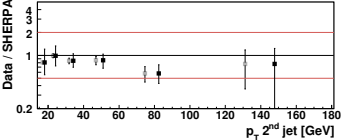
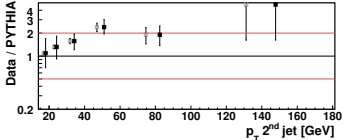
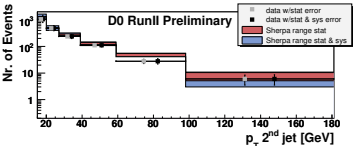
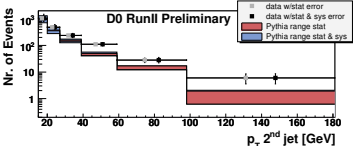
## Jet spectra (1st jet) in $p\bar{p} \rightarrow Z + X$



# Comparison with data from Tevatron

(D0-Note 5066)

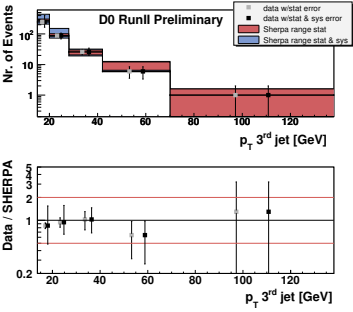
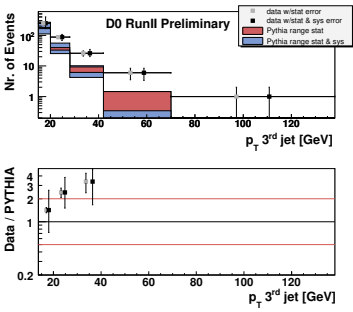
## Jet spectra (2nd jet) in $p\bar{p} \rightarrow Z + X$



# Comparison with data from Tevatron

(D0-Note 5066)

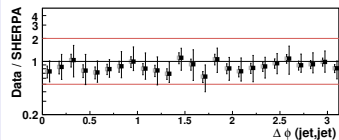
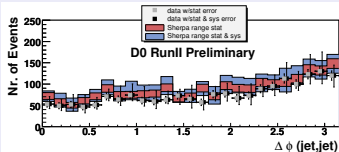
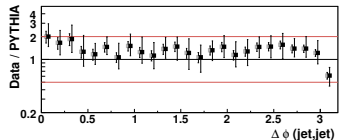
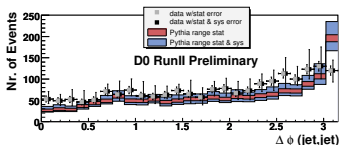
## Jet spectra (3rd jet) in $p\bar{p} \rightarrow Z + X$



# Comparison with data from Tevatron

(D0-Note 5066)

## Azimuthal correlation ( $\angle_{1,\text{jet},2,\text{jet}}$ ) in $p\bar{p} \rightarrow Z + X$





# Plans

## Immediate future (this year)

- Finish SHERPA:
  - Tune new cluster hadronization to LEP data & finish 1st round of hadron decays
  - Finalise new model for underlying event
- Extend/improve SHERPA:
  - Implement MHV amplitude techniques (go to higher jet multis)
  - New parton showers (based on dipole subtraction terms better suited for MC@NLO)
  - Maybe: more models (RPV, UED, Gravitinos)