Jet profiles in MC and Data

- Used Data + MC samples
- Event selection
- transverse shape
- energy profile

Used samples

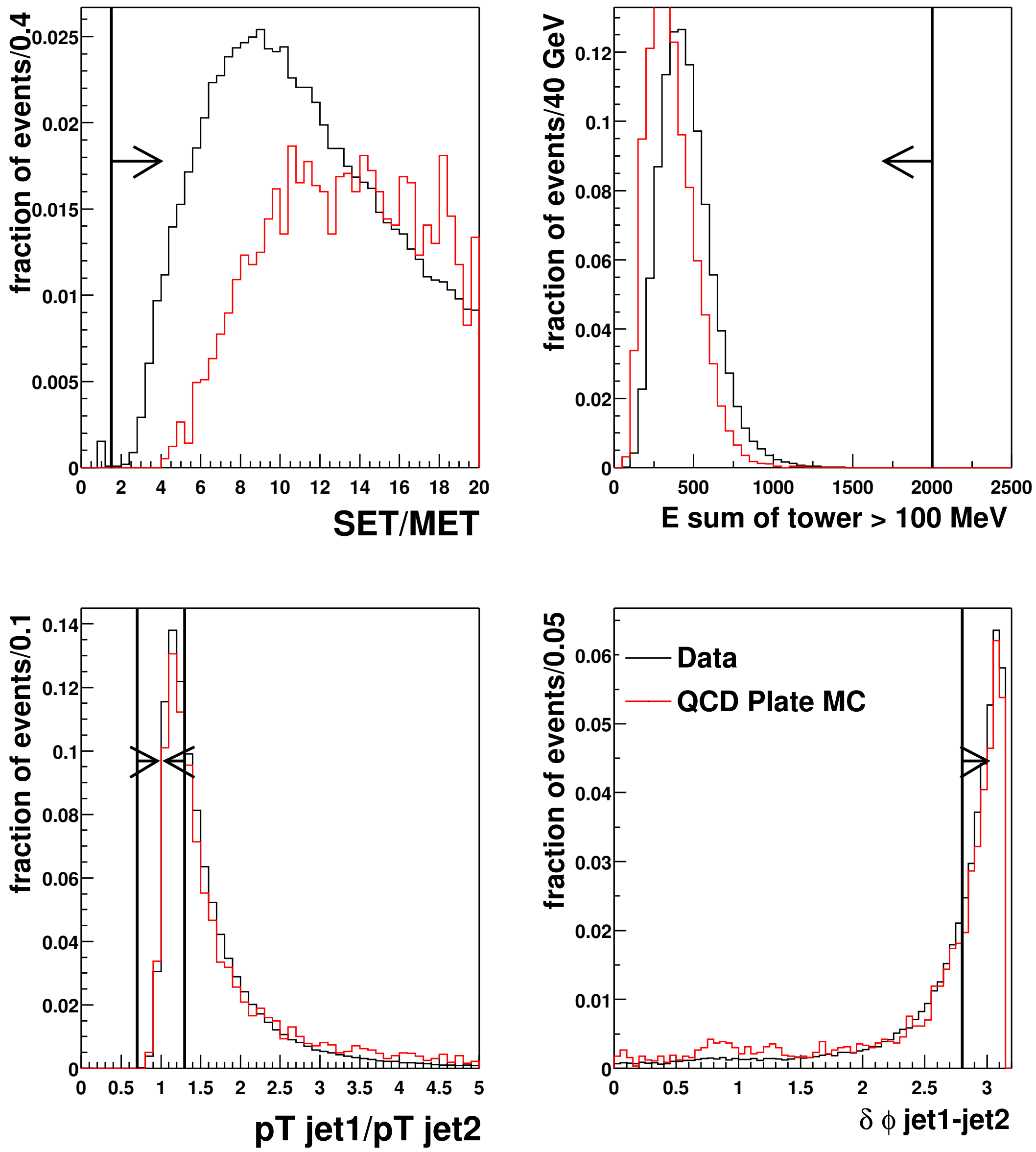
QCD MC:

- Pt$>$ 40 GeV, 0.5 mb poisson
- Plate geometry (difference in energy fractions, transverse shape similar ti Mixture)
- event selection like in data

Data:

- trigger: JT_HIx, L3 bit set and/or Mark&Pass
- L1: JT_HI_4CJT5 (5 trigger towers $>$ 5)
- L3: 60 GeV SCone, but written out unbiased
- Runs taken with Global CalMuon v. $>=$3.0
- reject Runs marked as bad by Jet/MET group

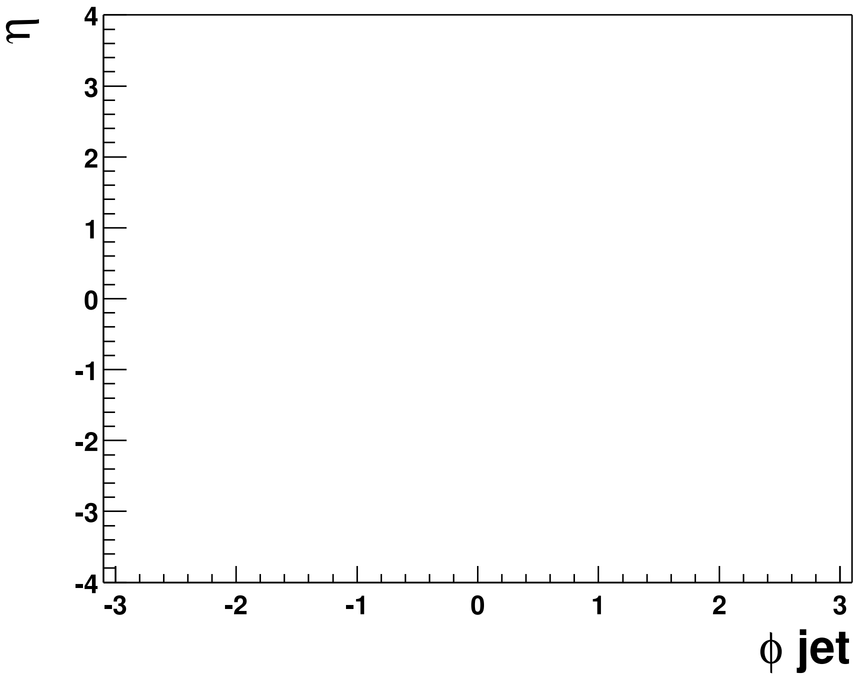
Event Selection

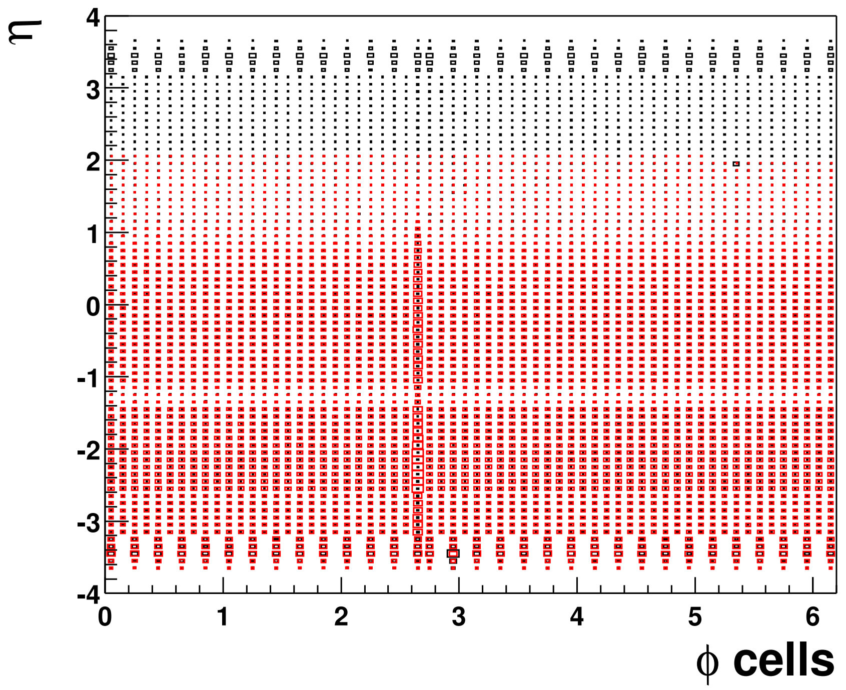


used election for Jet/MET studies:

- at least two good jets in EC or CC
- SET/MET > 1.5, $\Sigma E_T <$2000
- highest p_T jets back-to-back ($\delta\phi >$2.8)
- 0.7 $< p_T$(jet1)$/p_T$(jet2) $<$ 1.3
- use jet with $|\eta| <$0.5, for QCD MC $\eta <$0.

Jets - $\eta - \phi$





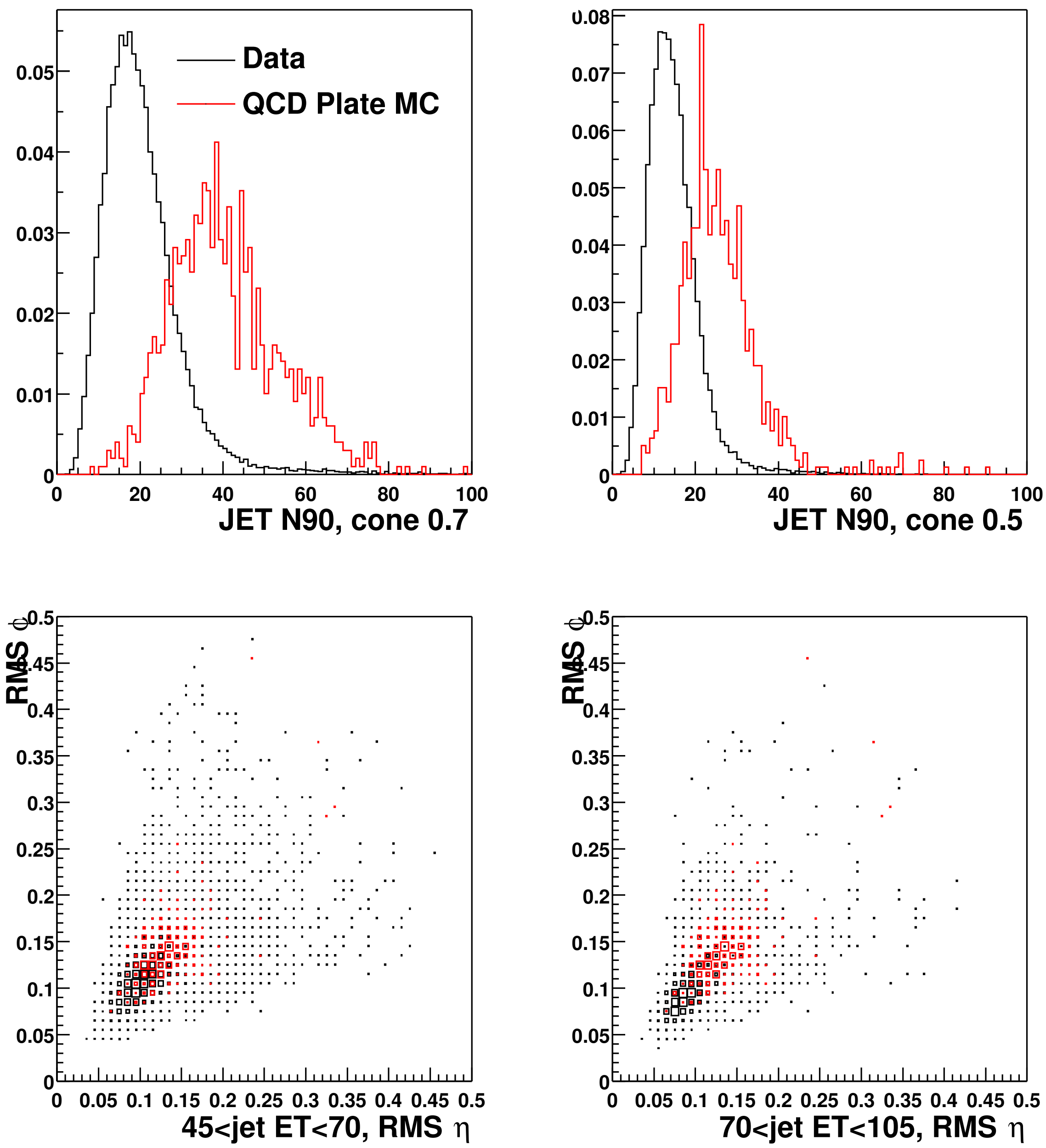
only message here:

don't use QCD events with positive η

Jets - n90 and jet widths

n90: # of towers containing 90% of the jet scalar ET

Jet widths in $\eta - \phi$



$\Rightarrow$ Jets are more narrow in data than in MC

Energy profile $\rho(r)$

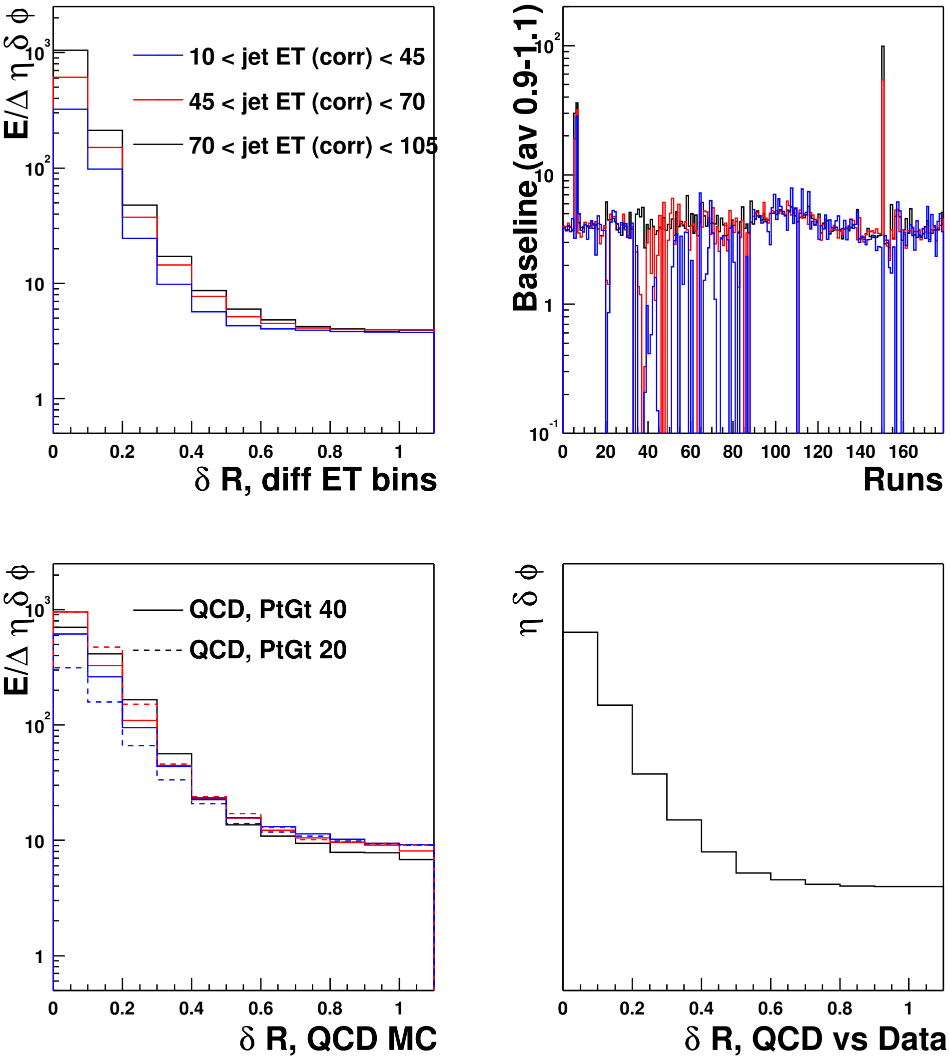
$$\rho(r) = \frac{\int_0^r E_T(r)}{\int_0^1 E_T(r)}$$

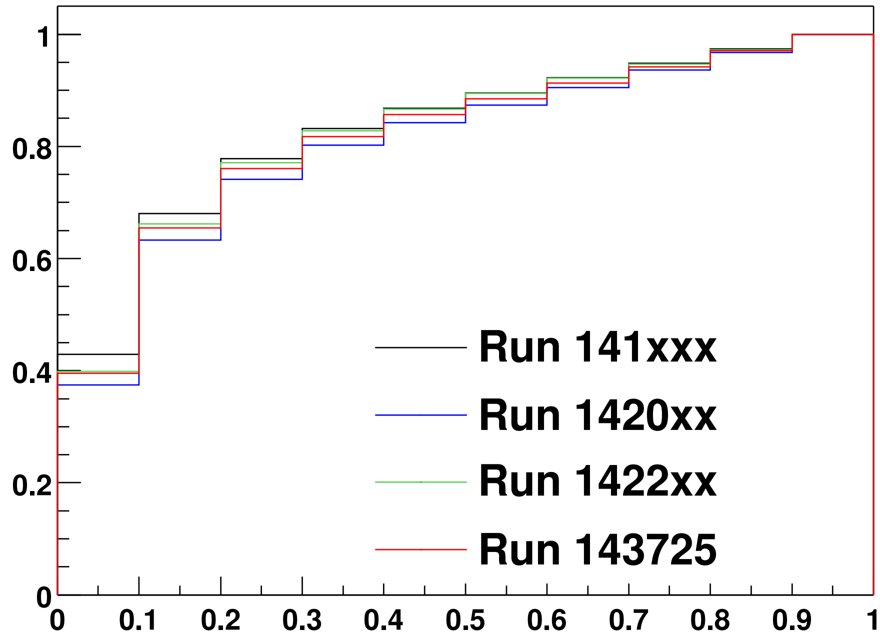
look at central jets (central: dEta)
for QCD MC: $\eta < 0.$
use CAL block of ntuple, sum E skalar + as vector
in cones of different δ R (steps of 0.1)
use only cells with E > 50 MeV

substract baseline energy as done jet JES group:
look at jets and average energy densities between 0.9 and 1.1 δR from center
substract this baseline energy density:
QCD MC: 8.0 GeV, Data: 3.5 GeV

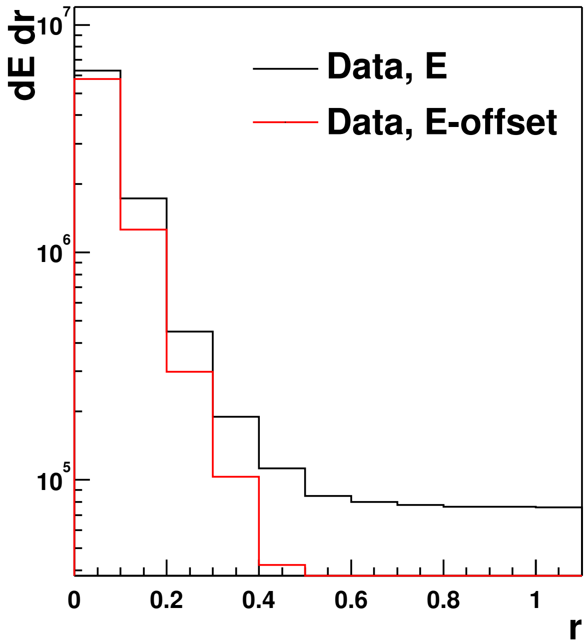
compare to Run I parametrisation from D0 Note 2885
use same pT bins: (10-45,) 45-70 and 70-105
pT bins defined with energy scale corrected energy

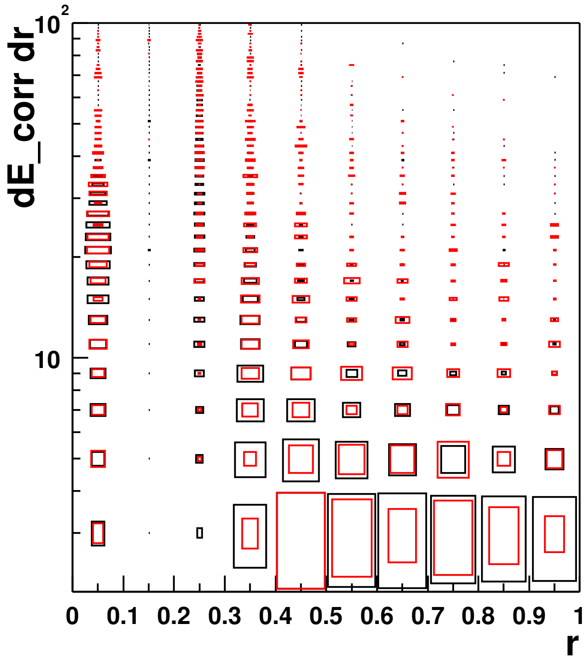
Baseline and change in time

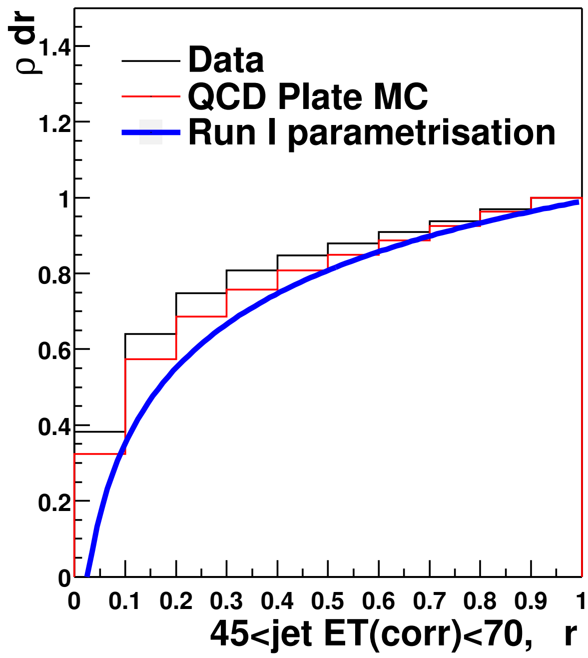


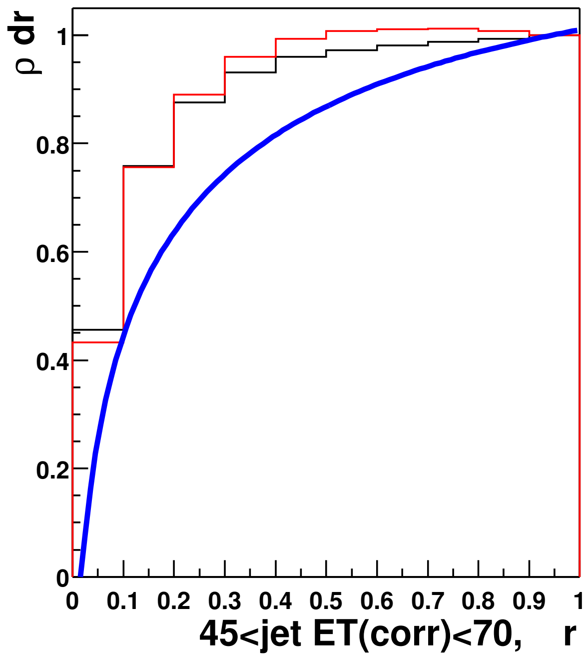

Run 141xxx
Run 1420xx
Run 1422xx
Run 143725
0
0.2
0.4
0.6
0.8
1
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Energy profile $\rho(r)$









Conclusions - or rather not

n90 looks very different
jet profiles look different in MC and data
jet parametrization depends **a lot** on the baseline substraction
without: Run I data agrees with better with MC than Run II data
with: tendency seems to turn around

more checks concerning the baseline substraction, look at n90,
width before/after ...
use physics η rather than detector η

and
(this is the point for discussions
about what to look at next)