

JetWidth

Impact on Asymmetry(Data) and Response(MC)

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22. Octobre 2010

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1 JW-dependent Asymmetry on Data

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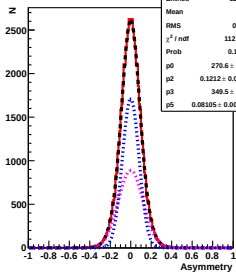
1 JW-dependent Asymmetry on Data

2 JW-dependent Response on MC

- fully corrected
- not corrected
- only L2L3-corrected
- E-deposit in towers/ η - ϕ -distance

- only Studied on calo-jets
- JetMETRun2010A-Sep17ReReco_v2_HLT_DiJetAve50UA
- Barrel only ($\eta < 1.2$)
- $\Delta\phi > 2.7$
- sum of corrected $P_t > 100$ GeV
- $n90Hits \geq 2$; $FHPD < 98\%$; $1 > EMF \geq 0.1$
- corrected $P_{t3} \leq 10\% * \frac{P_{t1} + P_{t2}}{2}$
- $\frac{\sigma[\phi] + \sigma[\eta]}{2} > 0.12$ for broad jets, else lean jets

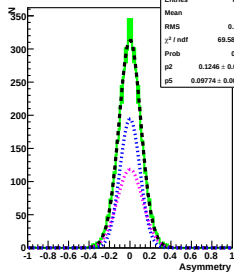
:A(p_⊥) lean [GeV]



hpt

Entries	62120
Mean	0
RMS	0.101
χ^2 / ndf	112 / 96
Prob	0.1263
p0	270.6 ± 36.1
p2	0.1212 ± 0.0028
p3	349.5 ± 36.1
p5	0.08105 ± 0.00219

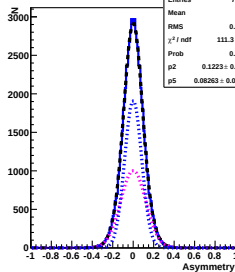
:A(p_⊥) broad [GeV]



hpt2

Entries	8494
Mean	0
RMS	0.1119
χ^2 / ndf	69.58 / 78
Prob	0.741
p2	0.1246 ± 0.0033
p5	0.09774 ± 0.00278

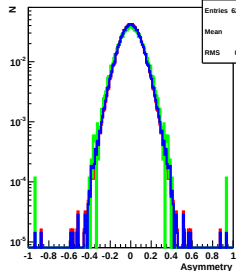
:A(p_⊥) sum [GeV]



hpt3

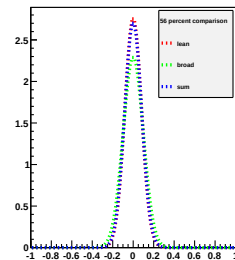
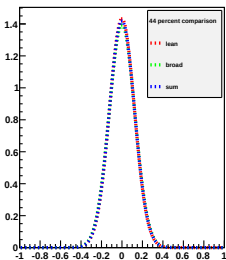
Entries	70614
Mean	0
RMS	0.1024
χ^2 / ndf	111.3 / 100
Prob	0.2074
p2	0.1223 ± 0.0007
p5	0.08263 ± 0.00059

:A(p_⊥) lean [GeV]



hpt

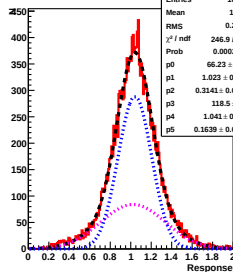
Entries	62120
Mean	0
RMS	0.101



- leaner asymmetry for lean jets
- less high asymmetry events for lean jets
- low statistics for broad jets
- reproducible for MC-response?

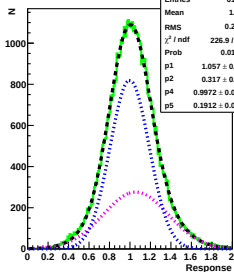
- only Studied on calo-jets
- QCDFlat_Pt15to3000Summer10-START36_V9_S09-v1B
- Barrel only ($\eta < 1.2$)
- $\Delta\phi > 2.7$
- 3 GenJetP_t-Bins: 0 – 50 GeV, 51 – 150 GeV, 151 – 300 GeV
- n90Hits $\geq$ 2; FHPD $<$ 98%; 1 $>$ _EMF $\geq$ 0.1
- corrected $P_{t3} \leq 10\% * \frac{P_{t1}+P_{t2}}{2}$
- $\frac{\sigma[\phi]+\sigma[\eta]}{2} > 0.12$ for broad jets, else lean jets
- 3 scenarios: fully corrected, not corrected, L2L3-corrected

:R(p₁) lean [GeV]



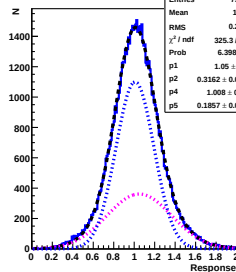
hpt	
Entries	18707
Mean	1.034
RMS	0.2333
χ^2 / ndf	246.9 / 175
Prob	0.0002823
p0	66.23 ± 6.19
p1	1.023 ± 0.006
p2	0.3141 ± 0.0088
p3	118.5 ± 6.3
p4	1.041 ± 0.002
p5	0.1639 ± 0.0040

:R(p₁) broad [GeV]



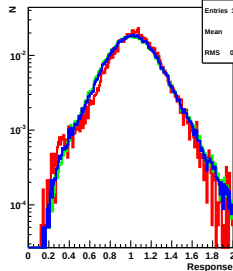
hpt2	
Entries	61208
Mean	1.018
RMS	0.2455
χ^2 / ndf	226.9 / 182
Prob	0.01328
p1	1.057 ± 0.003
p2	0.317 ± 0.002
p4	0.9972 ± 0.0017
p5	0.1912 ± 0.0012

:A(p₁) sum [GeV]

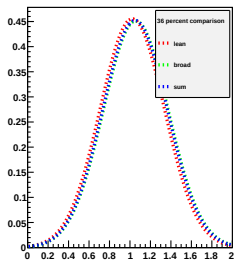


hpt3	
Entries	79915
Mean	1.022
RMS	0.2428
χ^2 / ndf	325.3 / 184
Prob	6.398e-10
p1	1.05 ± 0.00
p2	0.3162 ± 0.0016
p4	1.008 ± 0.001
p5	0.1857 ± 0.0010

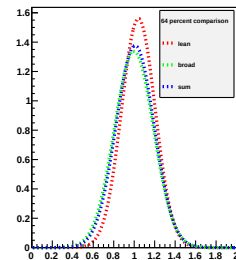
:R(p₁) lean [GeV]



hpt	
Entries	18707
Mean	1.034
RMS	0.2333

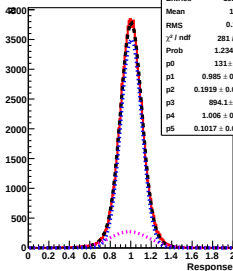


36 percent comparison	
lean	red dotted line
broad	green dotted line
sum	blue dotted line



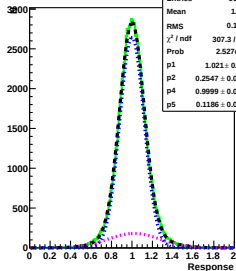
64 percent comparison	
lean	red dotted line
broad	green dotted line
sum	blue dotted line

:R(p_⊥) lean [GeV]



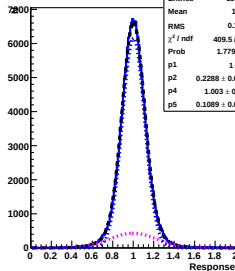
hpt	
Entries	102788
Mean	1.003
RMS	0.1187
χ^2 / ndf	281 / 133
Prob	1.234e-12
p0	131 ± 13.8
p1	0.985 ± 0.004
p2	0.1919 ± 0.0053
p3	894.1 ± 14.1
p4	1.006 ± 0.000
p5	0.1017 ± 0.0008

:R(p_⊥) broad [GeV]



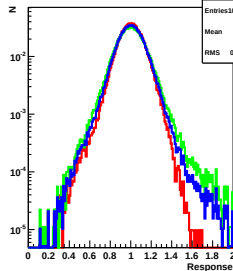
hpt2	
Entries	90373
Mean	1.003
RMS	0.1466
χ^2 / ndf	307.3 / 175
Prob	2.527e-09
p1	1.021 ± 0.003
p2	0.2547 ± 0.0020
p4	0.9999 ± 0.0005
p5	0.1186 ± 0.0004

:A(p_⊥) sum [GeV]

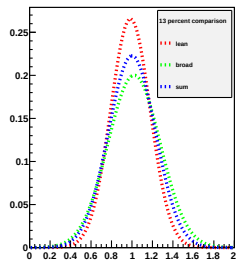


hpt3	
Entries	193161
Mean	1.003
RMS	0.1325
χ^2 / ndf	409.5 / 177
Prob	1.779e-20
p1	1 ± 0.0
p2	0.2288 ± 0.0012
p4	1.003 ± 0.000
p5	0.1089 ± 0.0002

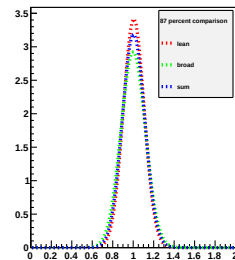
:R(p_⊥) lean [GeV]



hpt	
Entries	102788
Mean	1.003
RMS	0.1187

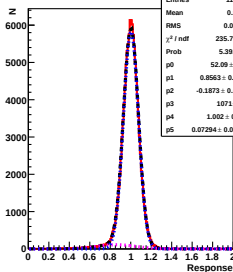


13 percent comparison	
lean	0.1187
broad	0.1466
sum	0.1325



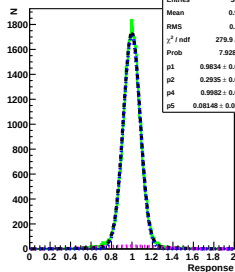
87 percent comparison	
lean	0.1187
broad	0.1466
sum	0.1325

:R(p_⊥) lean [GeV]



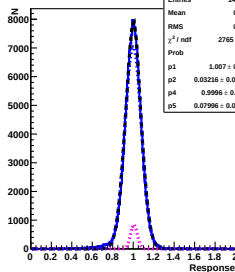
hpt	
Entries	112536
Mean	0.9955
RMS	0.08836
χ^2 / ndf	235.7 / 111
Prob	5.392e-11
p0	52.09 ± 1.96
p1	0.8563 ± 0.0052
p2	-0.1873 ± 0.0026
p3	1071 ± 3.8
p4	1.002 ± 0.000
p5	0.07294 ± 0.00022

:R(p_⊥) broad [GeV]



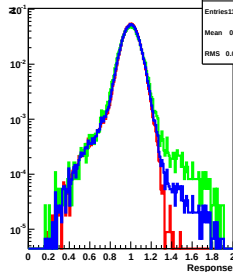
hpt2	
Entries	36734
Mean	0.9975
RMS	0.1059
χ^2 / ndf	279.9 / 158
Prob	7.928e-09
p1	0.9834 ± 0.0086
p2	0.2935 ± 0.0074
p4	0.9982 ± 0.0005
p5	0.08148 ± 0.00037

:A(p_⊥) sum [GeV]



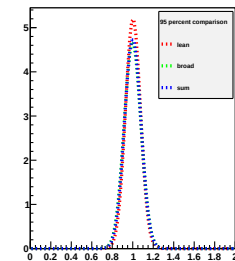
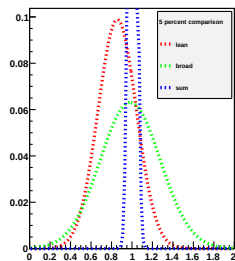
hpt3	
Entries	149270
Mean	0.996
RMS	0.093
χ^2 / ndf	2765 / 162
Prob	0
p1	1.007 ± 0.002
p2	0.03216 ± 0.00129
p4	0.9996 ± 0.0002
p5	0.07996 ± 0.00017

:R(p_⊥) lean [GeV]



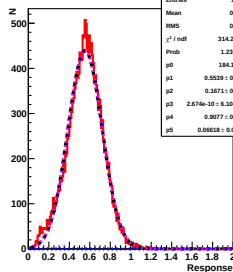
hpt

Entries	112536
Mean	0.9955
RMS	0.08836



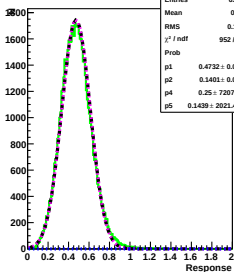
- similar response under trigger-treshold
- above leaner response for lean jets
- high P_t -tail only for broad jets
- general attribute of broad jets or miscorrection?

:R(p_⊥) lean [GeV]



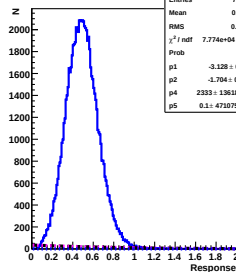
hpt	
Entries	18707
Mean	0.5522
RMS	0.1718
χ^2 / ndf	314.2 / 114
Prob	1.237e-20
p0	184.1 ± 1.4
p1	0.5539 ± 0.0013
p2	0.1671 ± 0.0010
p3	2.670e-10 ± 6.104e-04
p4	0.9077 ± 0.0003
p5	0.06618 ± 0.00013

:R(p_⊥) broad [GeV]



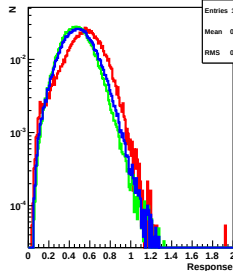
hpt2	
Entries	61208
Mean	0.475
RMS	0.1478
χ^2 / ndf	952 / 124
Prob	0
p1	0.4732 ± 0.0006
p2	0.1401 ± 0.0004
p4	0.25 ± 72079.99
p5	0.1439 ± 2021.4156

:A(p_⊥) sum [GeV]



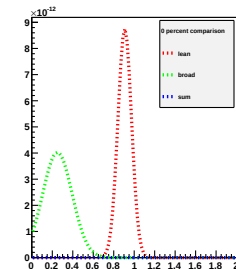
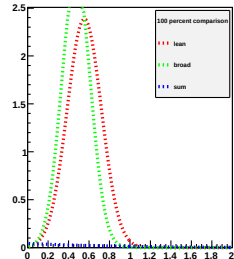
hpt3	
Entries	79915
Mean	0.4931
RMS	0.1572
χ^2 / ndf	7.774e+04 / 129
Prob	0
p1	-3.128 ± 0.061
p2	-1.704 ± 0.032
p4	2333 ± 1361826.0
p5	0.1 ± 47107592.0

:R(p_⊥) lean [GeV]

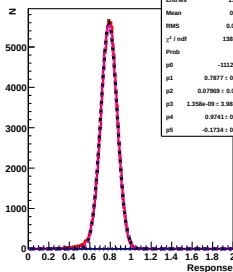


hpt

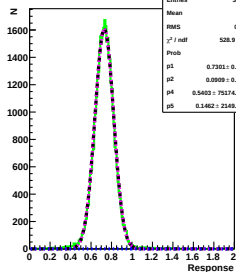
Entries	18707
Mean	0.5522
RMS	0.1718



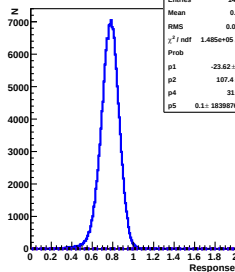
:R(p_⊥) lean [GeV]



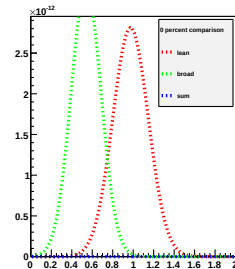
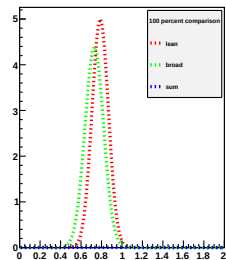
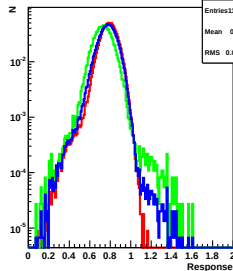
:R(p_⊥) broad [GeV]



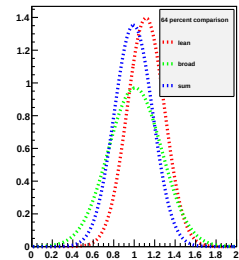
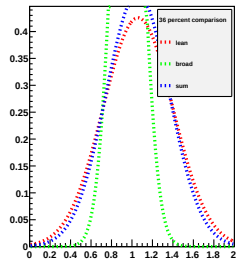
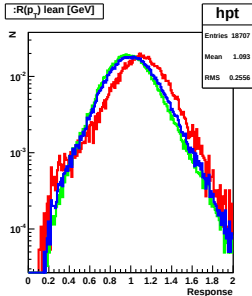
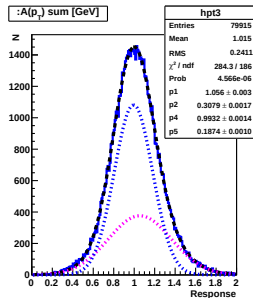
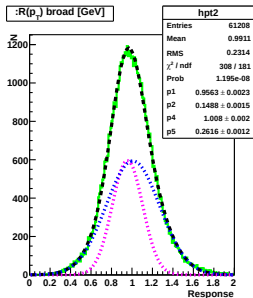
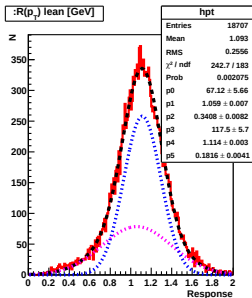
:A(p_⊥) sum [GeV]



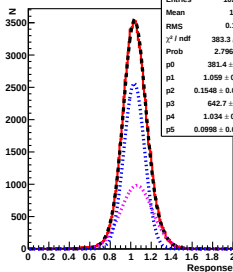
:R(p_⊥) lean [GeV]



- similar response under trigger-treshold
- above leaner response for lean jets
- smaller JECs for lean jets
- high P_t -tail only for broad jets

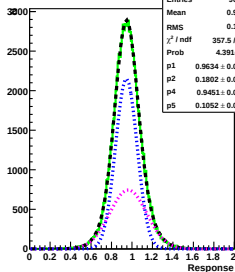


:R(p_⊥) lean [GeV]



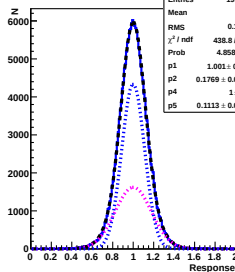
hpt	
Entries	102788
Mean	1.042
RMS	0.1267
χ^2 / ndf	383.3 / 141
Prob	2.796e-24
p0	381.4 ± 31.1
p1	1.059 ± 0.001
p2	0.1548 ± 0.0026
p3	642.7 ± 31.1
p4	1.034 ± 0.001
p5	0.0998 ± 0.0014

:R(p_⊥) broad [GeV]



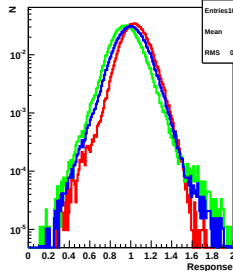
hpt2	
Entries	90373
Mean	0.9528
RMS	0.1423
χ^2 / ndf	357.5 / 172
Prob	4.391e-15
p1	0.9634 ± 0.0014
p2	0.1802 ± 0.0009
p4	0.9451 ± 0.0008
p5	0.1052 ± 0.0005

:A(p_⊥) sum [GeV]

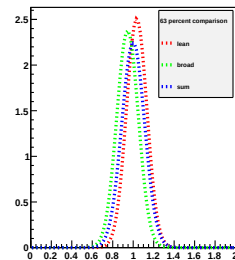
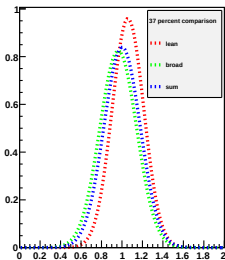


hpt3	
Entries	193161
Mean	1
RMS	0.1414
χ^2 / ndf	438.8 / 173
Prob	4.858e-25
p1	1.001 ± 0.001
p2	0.1769 ± 0.0007
p4	1 ± 0.0
p5	0.1113 ± 0.0004

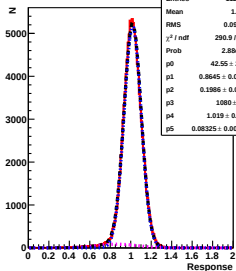
:R(p_⊥) lean [GeV]



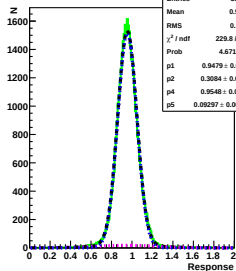
hpt	
Entries	102788
Mean	1.042
RMS	0.1267



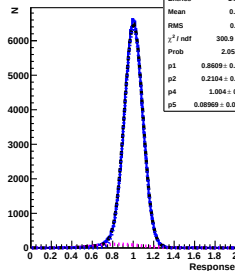
:R(p_⊥) lean [GeV]



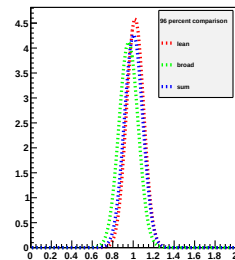
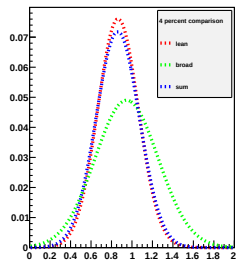
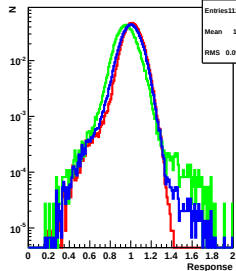
:R(p_⊥) broad [GeV]



:A(p_⊥) sum [GeV]

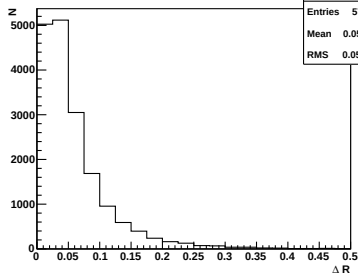
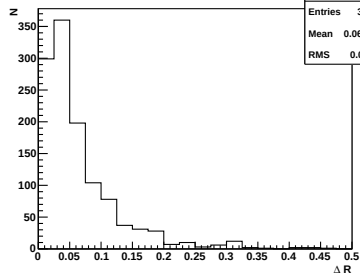


:R(p_⊥) lean [GeV]

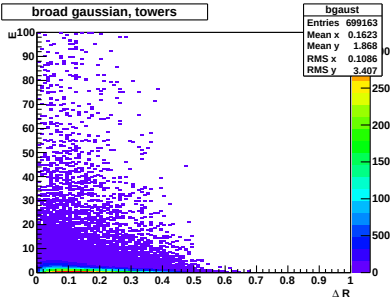


- similar response under trigger-treshold
- above leaner response for lean jets
- L4 may smear broad jets in the tail
- high P_t -tail only for broad jets

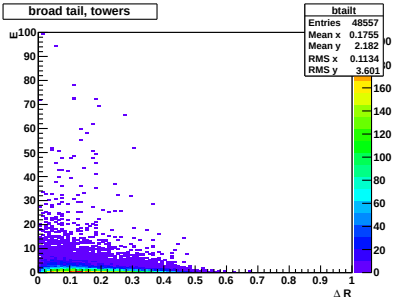
- same data and same cuts as prior
- only broad jets shown
- cut into two bins: tail-part and gaus-part
- displayed ΔR is defined as the distance in $\eta - \phi$ -space
- for the upper two graphs ΔR is for the jet-centers in respect to their genjet-centers
- for the lower two graphs ΔR is the distance of the tower to the jet-center
- again in the P_t -Bins: 0 – 50 GeV,
51 – 150 GeV, 151 – 300 GeV

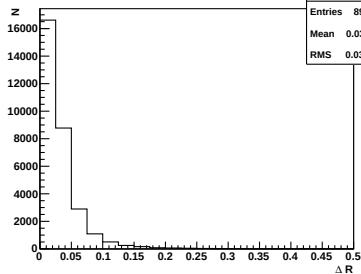
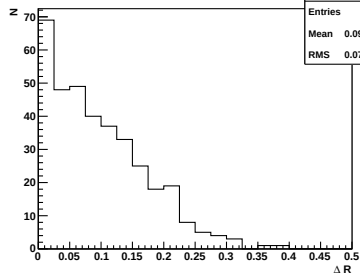
broad gaussian, ΔR broad tail, ΔR 

broad gaussian, towers

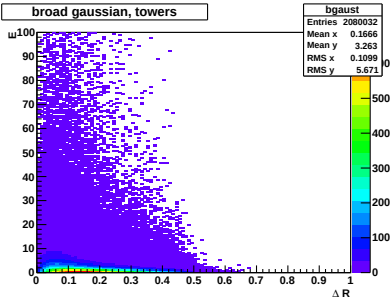


broad tail, towers

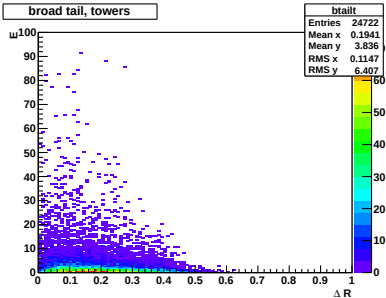


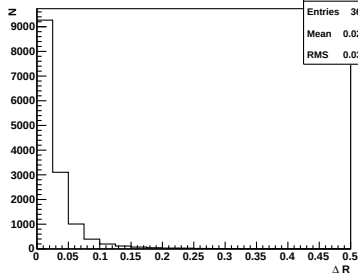
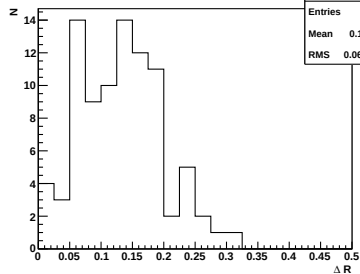
broad gaussian, ΔR broad tail, ΔR 

broad gaussian, towers

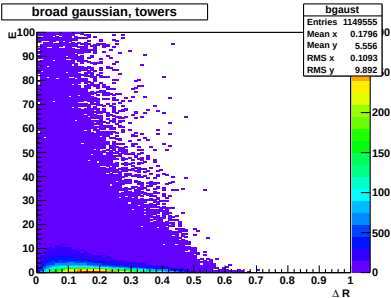


broad tail, towers

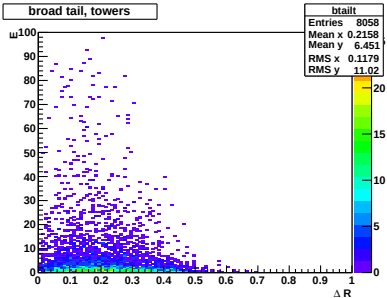


broad gaussian, ΔR broad tail, ΔR 

broad gaussian, towers



broad tail, towers



- similar eta-phi-distances below trigger-treshold
- above tail-jets have a larger divergence from their respective genjets
- the tower-distribution for tail and gauss is almost similar
- slightly higher rate of high-energy-deposits in tail-towers - δ Noise?
- high P_t -tail only for broad jets