PROCESSING JET/MET DATA WITH ORCA 4

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- Tasks
- Test examples
- JET/MET Ntuple maker
- Processed samples
- Known problems
- Plans

TASKS

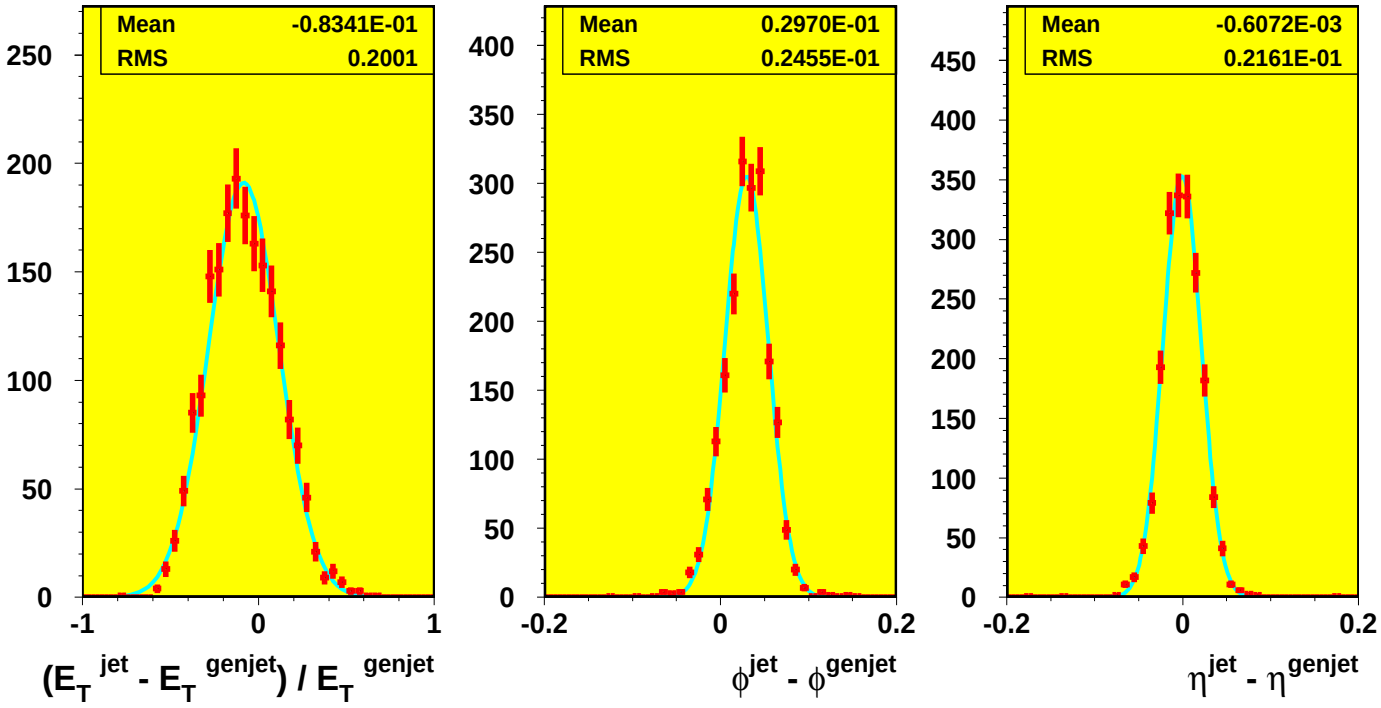
- Verify ORCA 4
- Rewrite JET/MET Ntuple maker accordingly
- Process HLT data samples
  - Create a set of Ntuples

ORCA 4 FEATURES

- **New pile up mechanism**
- **Calorimeter : bug fixed in HB-HE region**
- **New L1**
  - *seamless 12x12 sliding window up to* $\eta = 5$
  - *HF included in MET*
  - *new* τ *- algorithm*
- **Set of JetFinders**
  - *HLT algorithm : search in the prescribed region* NEW
  - *IterativeConeAlgorithm - widely used*
  - • • •

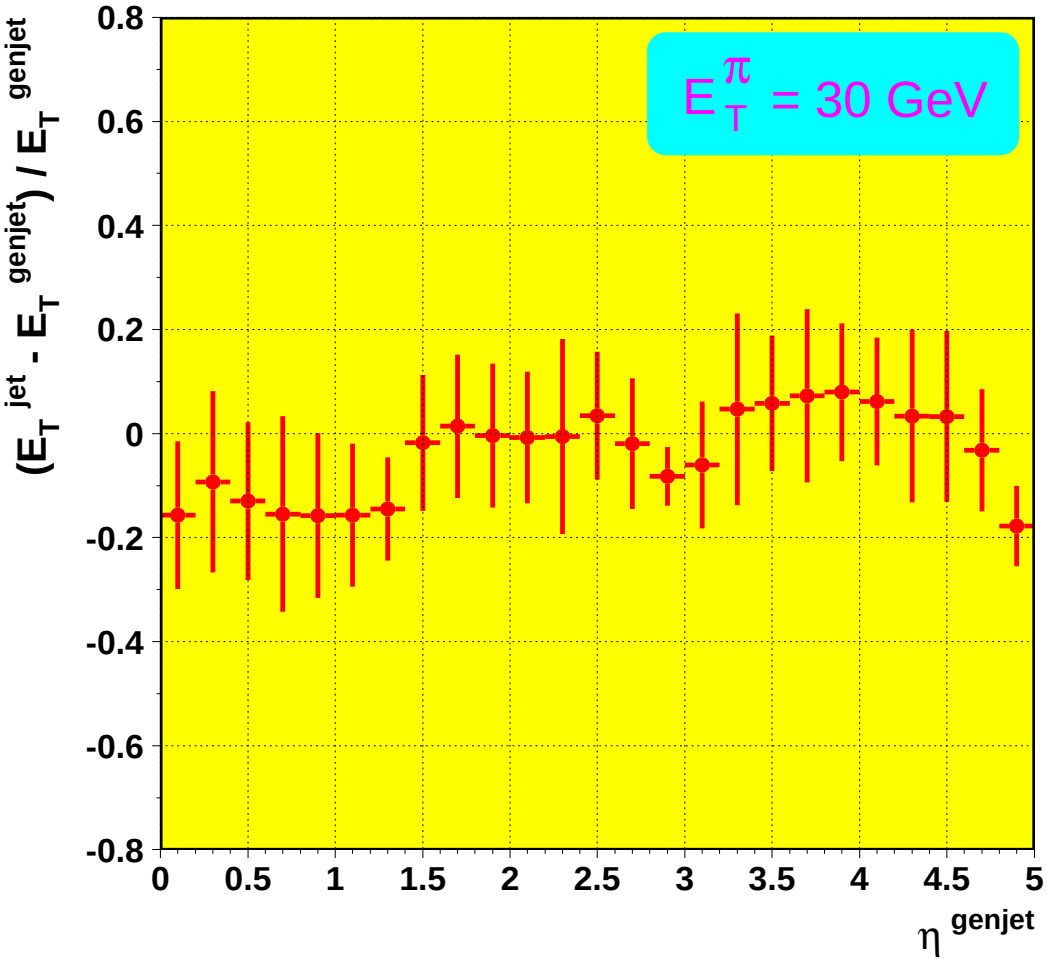
A SINGLE PION TEST (I)

- **Calibration :**
  - *ECAL - with electrons*
  - *HB/HE - with E_T = 50 GeV pions*
  - *HF - with 1 TeV jets*



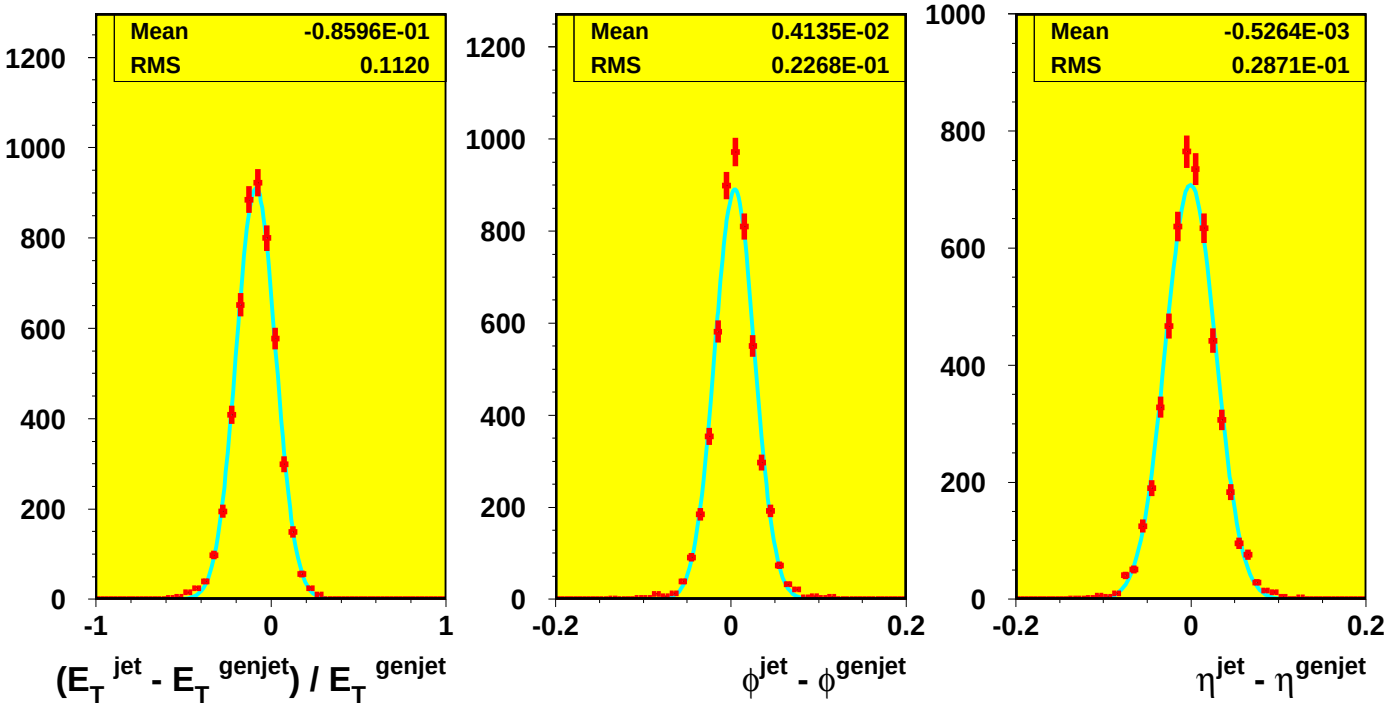
- √ E_T^{π} = 30 GeV
- √ IterativeConeAlgoritm
- √ EcalPlusHcalTowers

A SINGLE PION TEST (II)

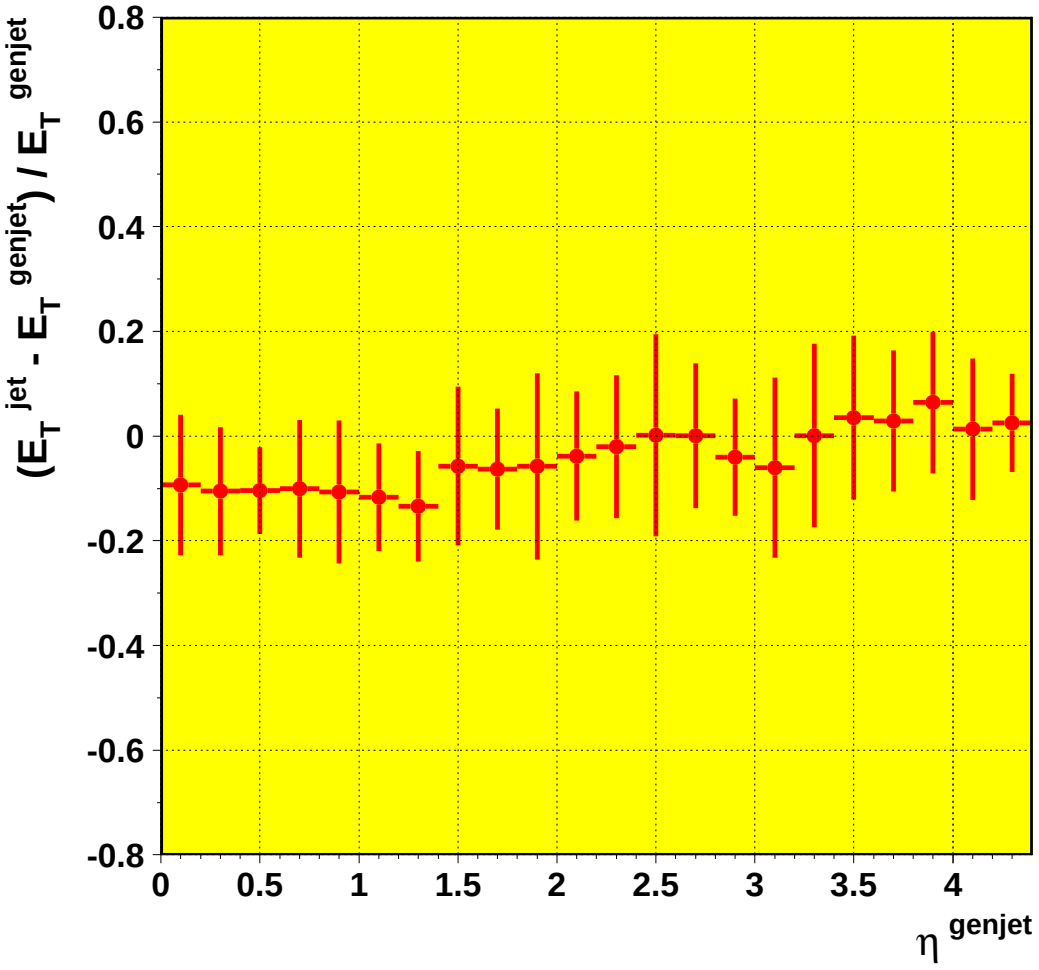


QCD JETS TEST (I)

- $\hat{P}_T$ = 120 - 170 GeV with in-time + out-of-time pile up
  - *IterativeConeAlgorithm, R = 0.5, aSeed = 1.*
  - *EcalPlusHcalTowers*



QCD JETS TEST (II)



DATA SAMPLES (I)

- **QCD : $\hat{P}_T$ = 10 - 470 GeV**

	events
10 - 15	94 798
15 - 20	128 331
20 - 30	205 520
30 - 50	99 241
50 - 80	32 043
80 - 120	16 140
120 - 170	11 518
170 - 230	1 280
230 - 300	1 280
300 - 380	1 280
380 - 370	1 360
	590 k

- **Minimum bias samples :**

	events
Nopileup2	116 680
- single min.bias evens	
IntimeUnique	4930
- intime only, no recycling	
UniquePileup	490
- full pileup, no recycling	
PurePileup	80 000
- full pileup with recycling	

DATA SAMPLES (II)

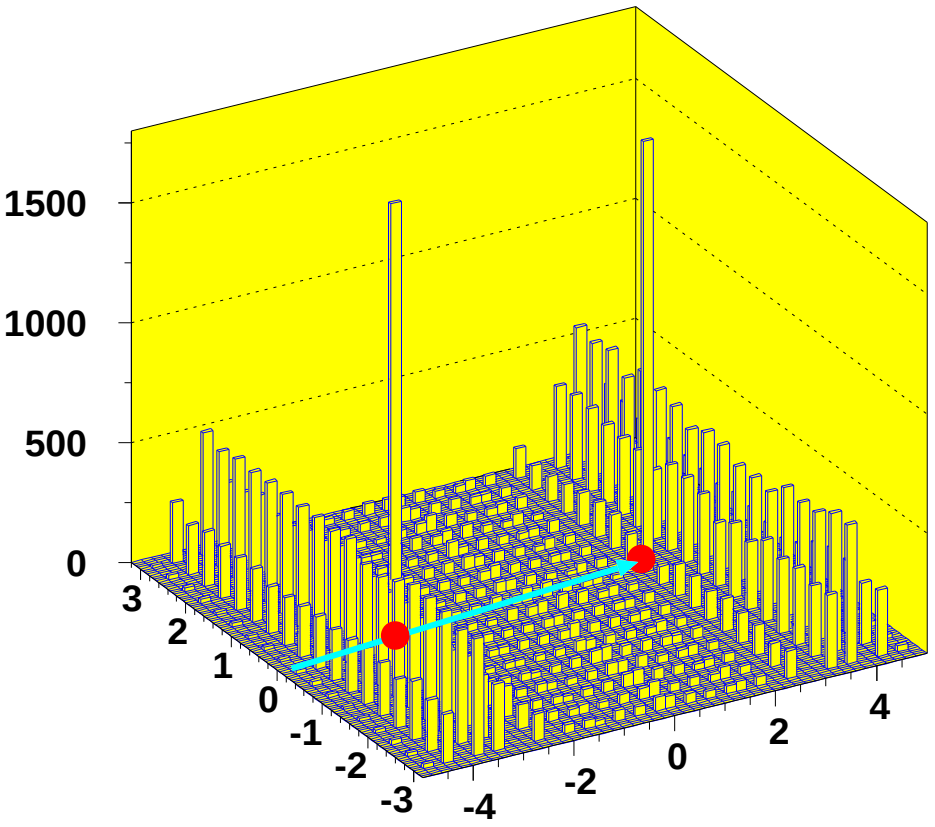
- **SM Higgs (with/without pile up)** — events
  - H (200 GeV) → τ τ → ej / eμ / jj — 4095/4000/4500
  - H (500 GeV) → τ τ → jj — 6500
- **SM Higgs (with pile up)**
  - qq H (135 GeV) → τ τ → ej — 3000
  - t t H (135 GeV) → τ τ → ej — 4008
- **SUSY Higgs (with/without pile up)**
  - H (500 GeV) → τ τ → jj — 4483
- **mSUGRA (with pile up)** — 4482

JET/MET NTUPLE MAKER

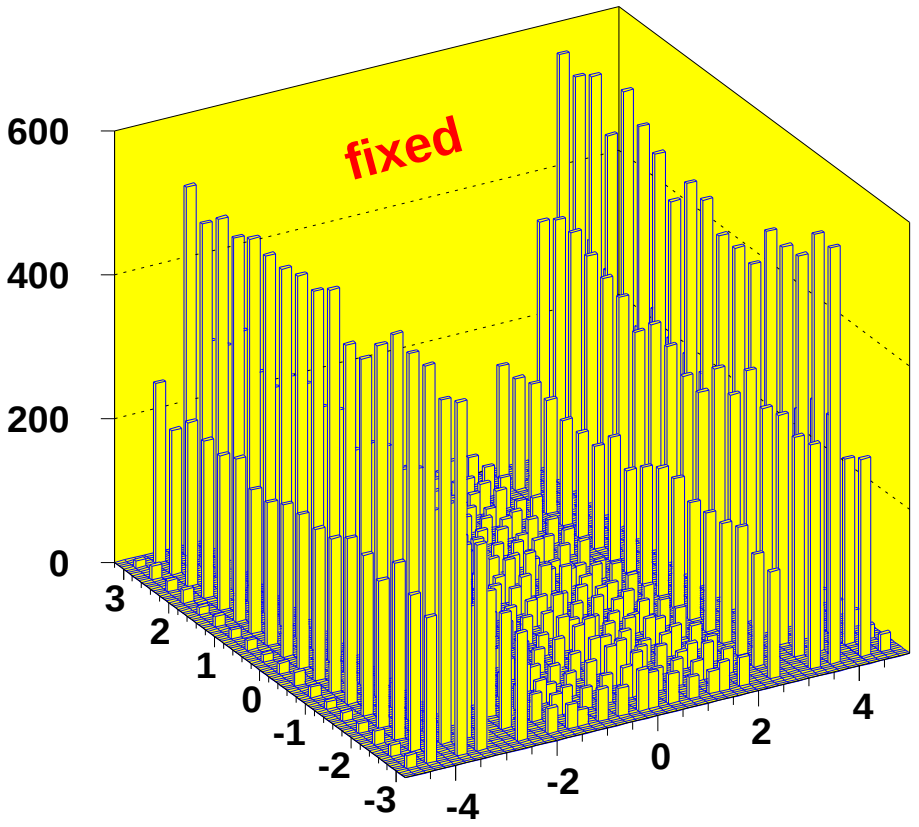
GENERAL	*title, evet and run #*
GENPART	*particle data*
PARTON	*parton data*
GENJETS	*particle-level jets, choice of algorithm*
L1T	*L1 objects, sumET, MET*
TOWERS	*EcalPlusHcalTower data*
DIGI	*CaloRecHit data*
AVEDIGI	*summary on various CaloRecHit quantities*
TRIGPRIM	*EcalTrigPrim + HcalTrigPrim data*
JETS	*off-line jets, choice of algorithm*
MET, MET2	*various quantities related to MET*
MINBIASI	*run and event ## of min.bias (MET > thresh.)*

KNOWN PROBLEMS (I)

HcalTrigPrim phi index in the last HE ring ($\eta = 2.825$)



L1 objects : phi vs eta

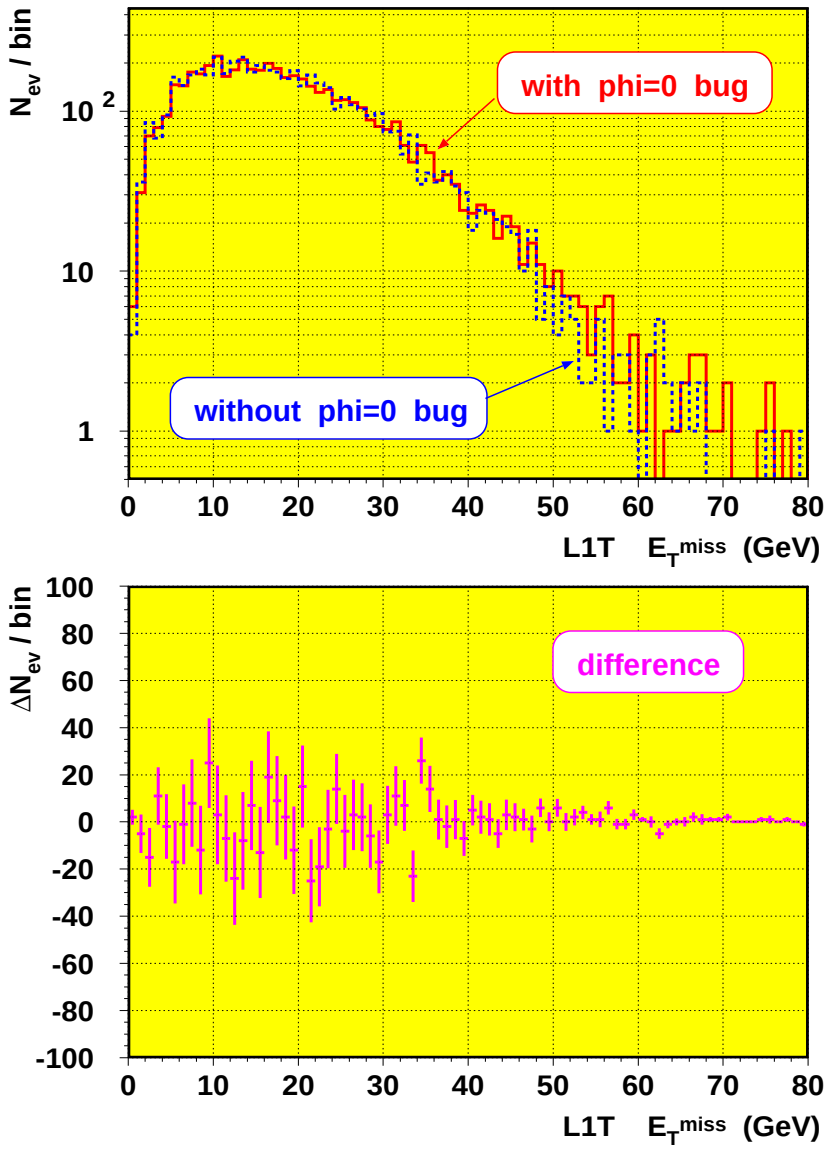


L1 objects : phi vs eta

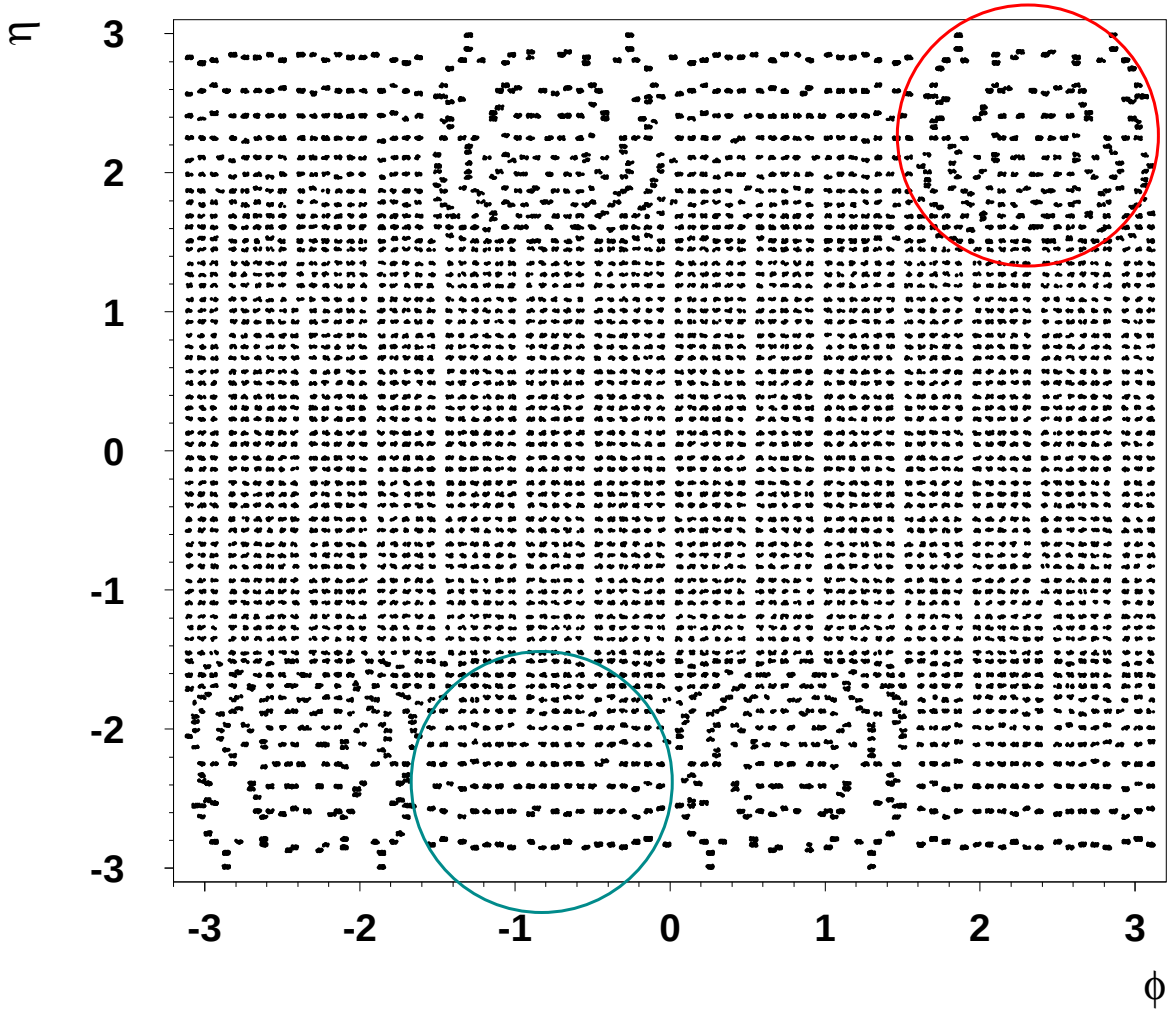
KNOWN PROBLEMS (II)

- **IntimeUnique pile up**

bug causes moderate smearing of l1met around true value



THE TITLE OF THE TRANSPARENCY



- **EcalTrigPrim map**

irregular structure in some quadrants of Ecal endcap

C.Seez shown :

small effect on ECAL trigger

Plans

- **Update CMSIM geometry (v.120)**
- **Improve simulation of HCAL readouts**
- **New Ntuple maker including all objects : muons, e/gamma, jets etc.**
  - *easily expandable and customizeable*
- **Increase data samples**
  - *min.bias : 5-10 times more*