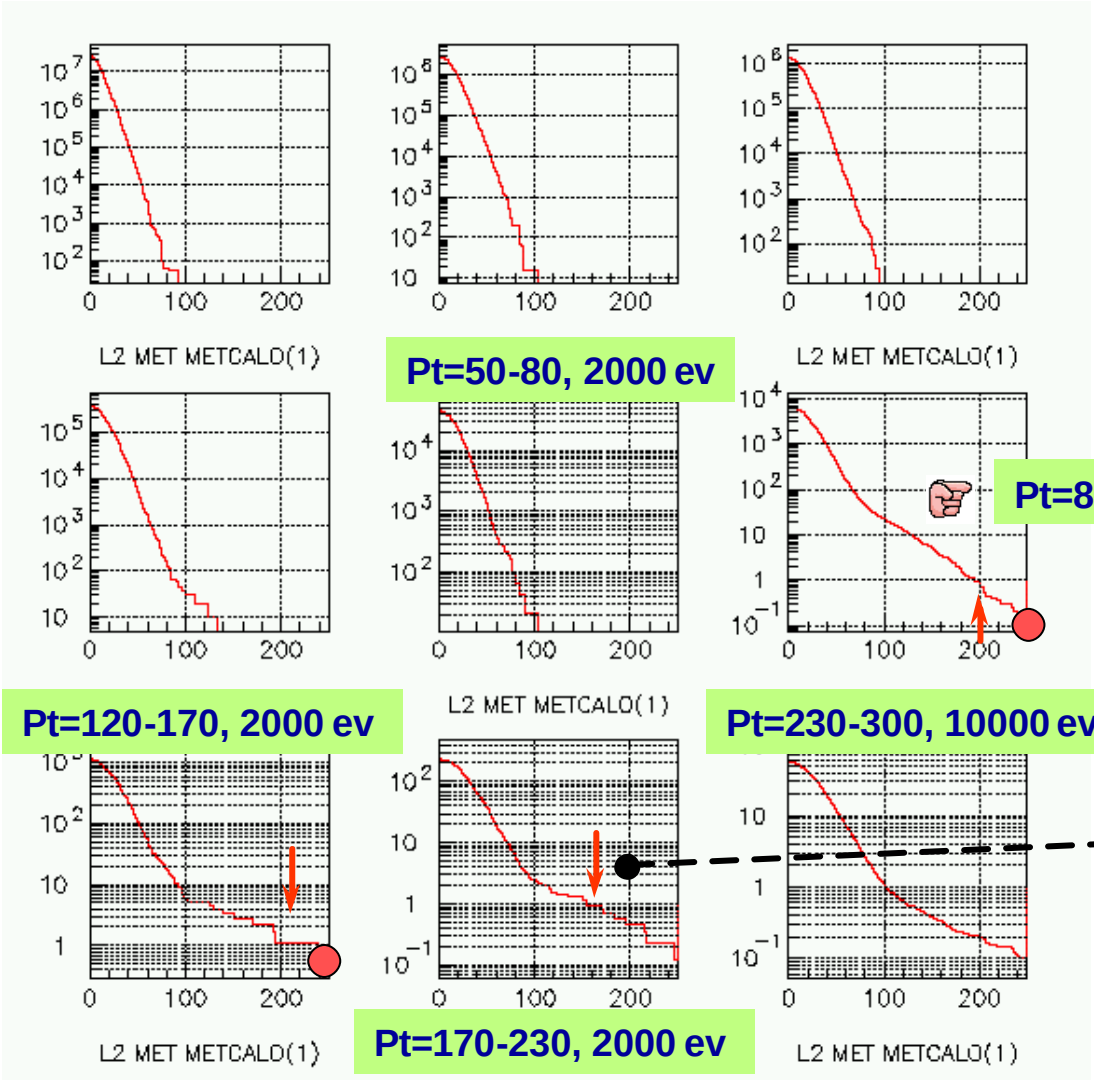
S.Abdullin

CURRENT STATUS OF MET

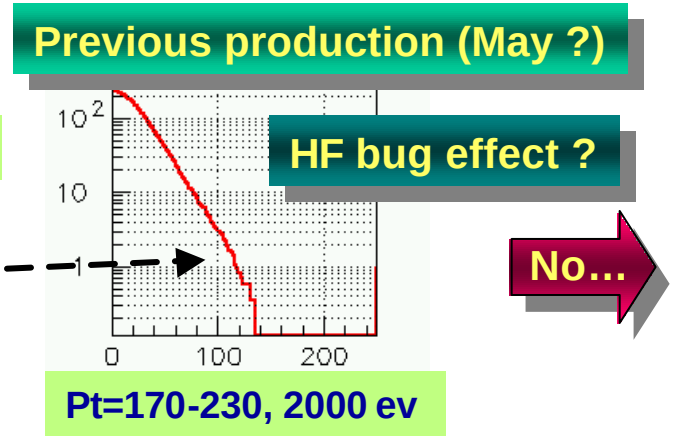
Outline

- Problem : high-MET tail appeared in ORCA_6_2_0-made Ntuples
- Troubleshooting : ORCA or CMSIM ?
- Event filter (patch)
- Low luminosity MET rates
- High luminosity MET rates
- High-lumi QCD rate for 95 % eff. MET cut for invisible Higgs (120 GeV)
- Remarks on the HF filter …

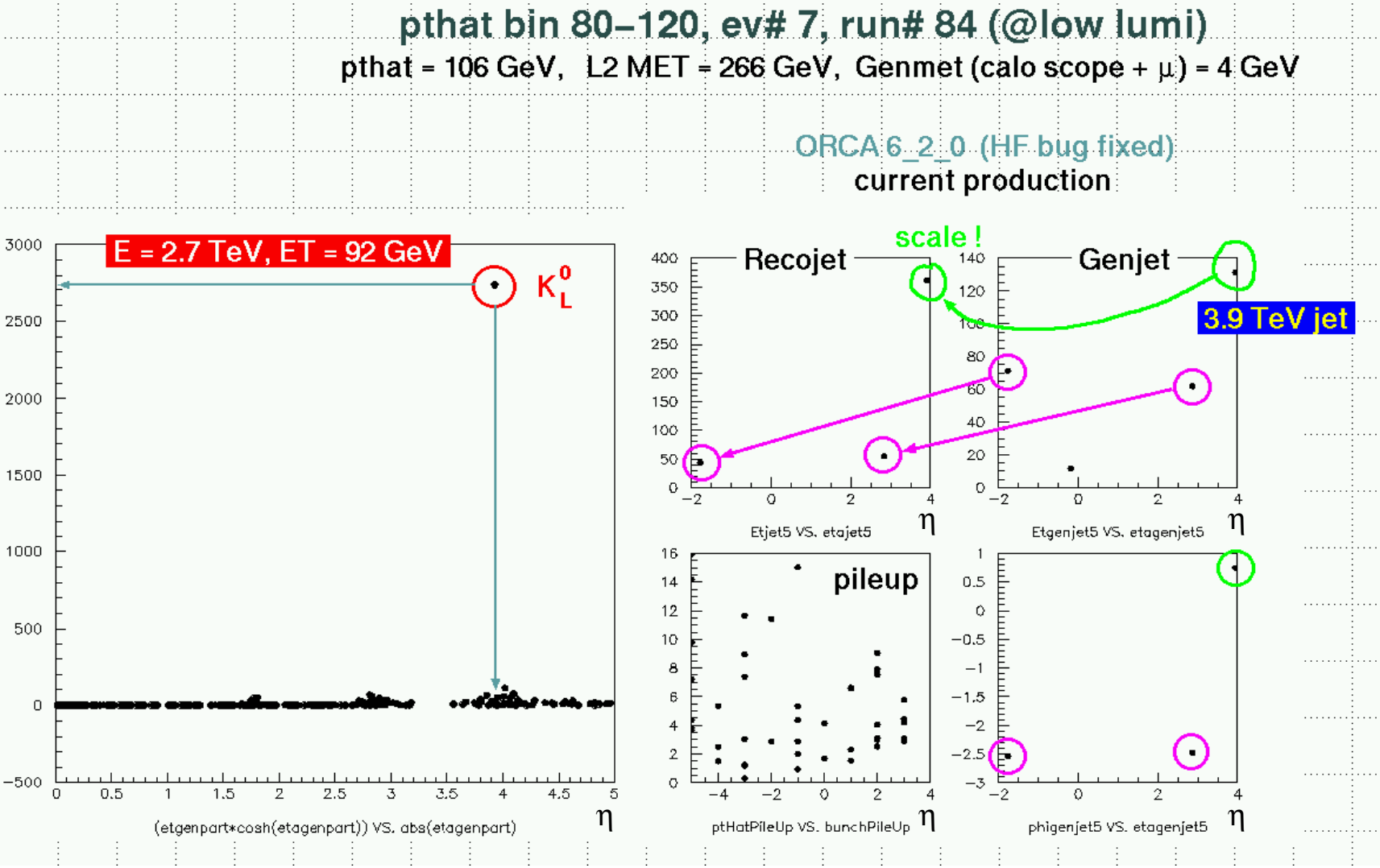
Reminder : High MET Problem



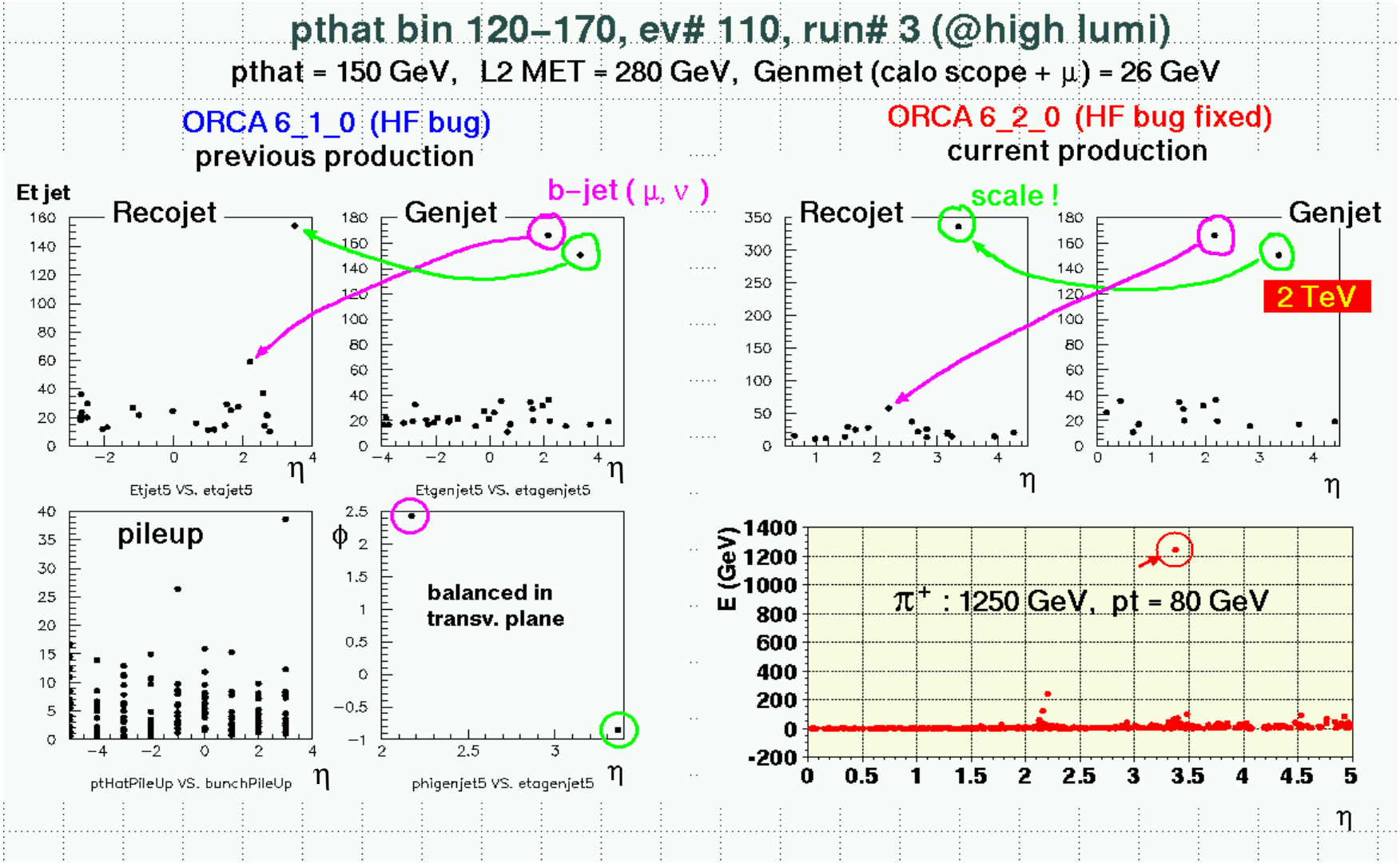
- Problem at high MET in new Ntuples
- ORCA_6_2_0 (HF bug fixed)



“Anomalous” Event I

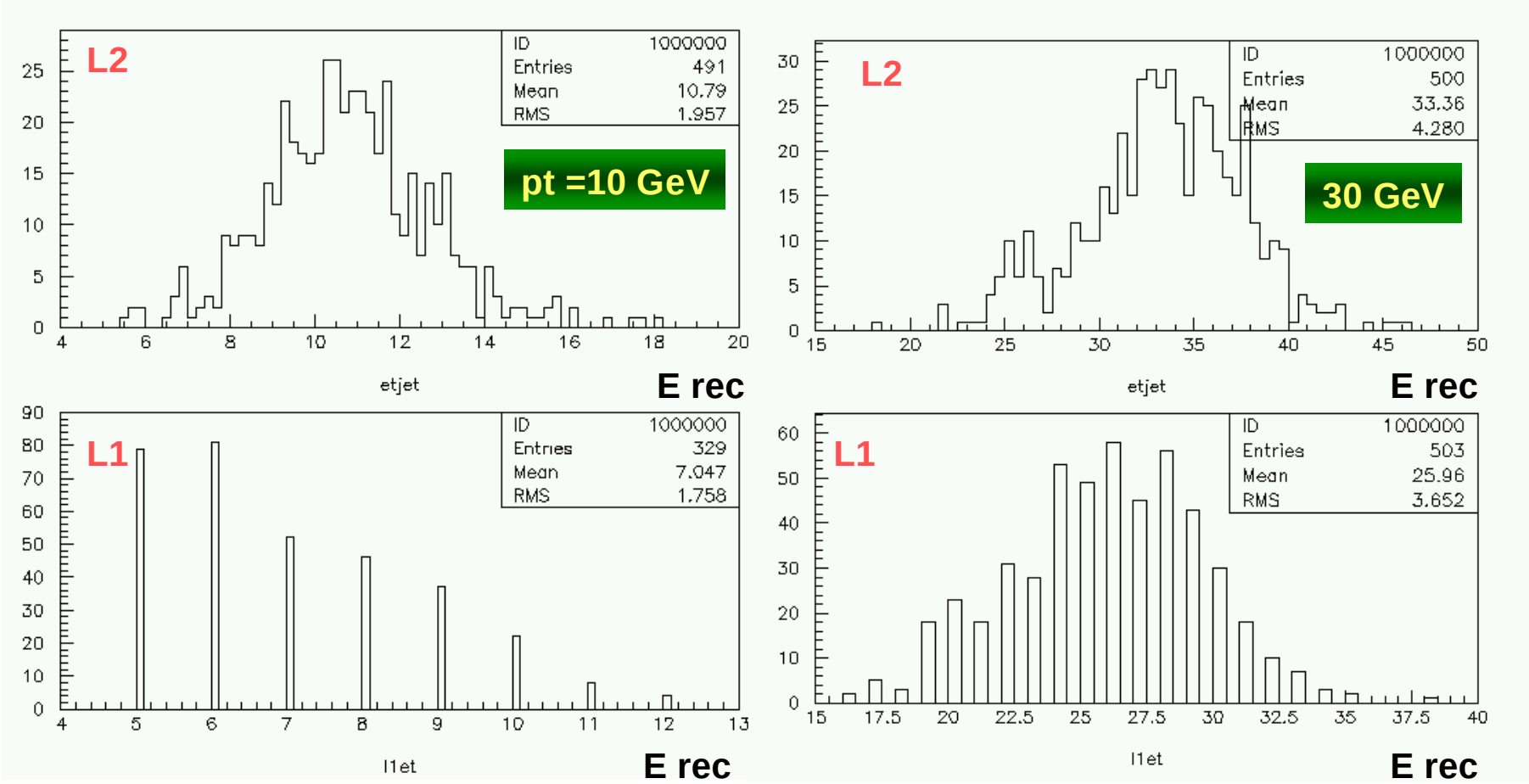


“Anomalous” Event II



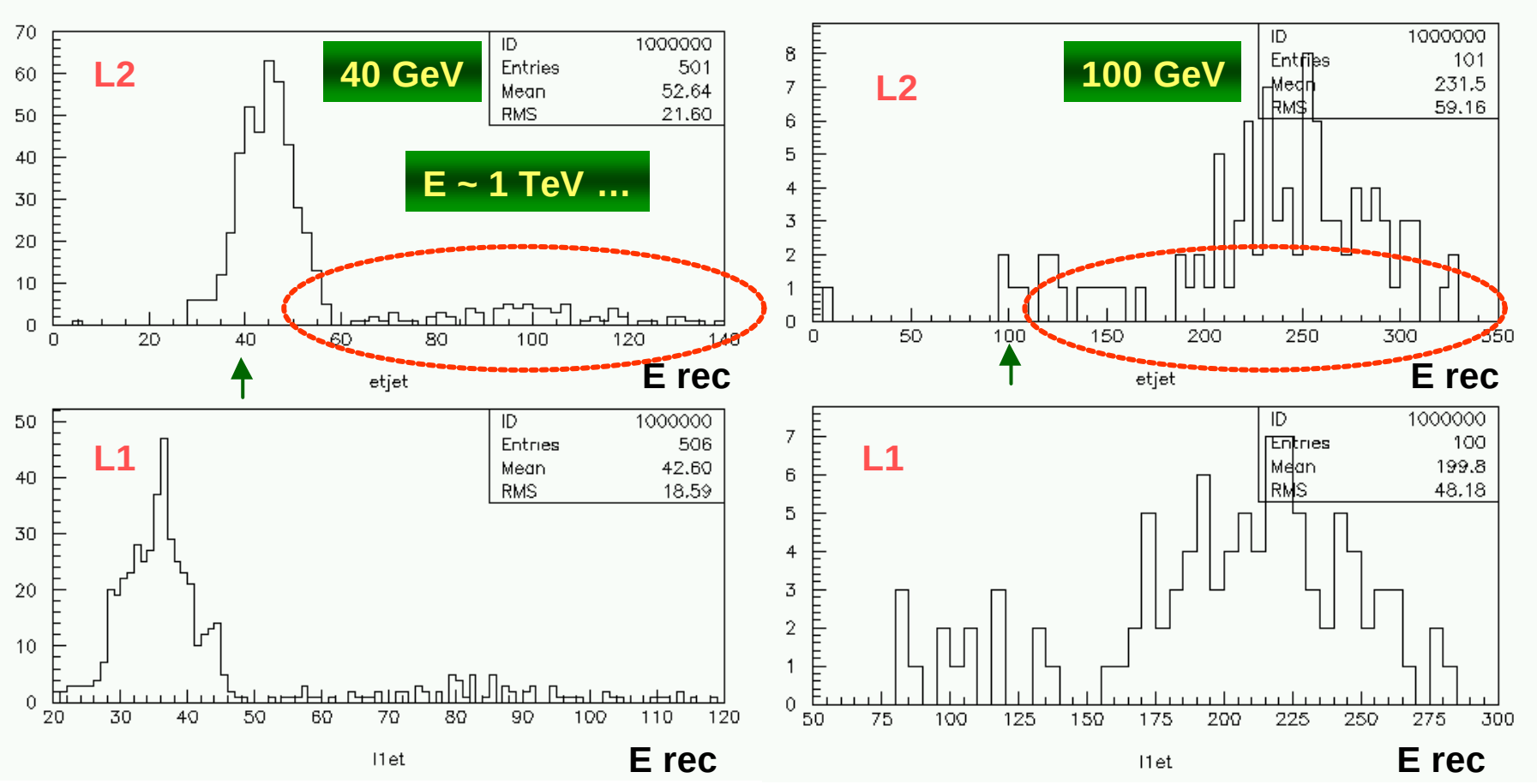
Single-p Shooting at HF (I)

☞ h = 3.88-3.92

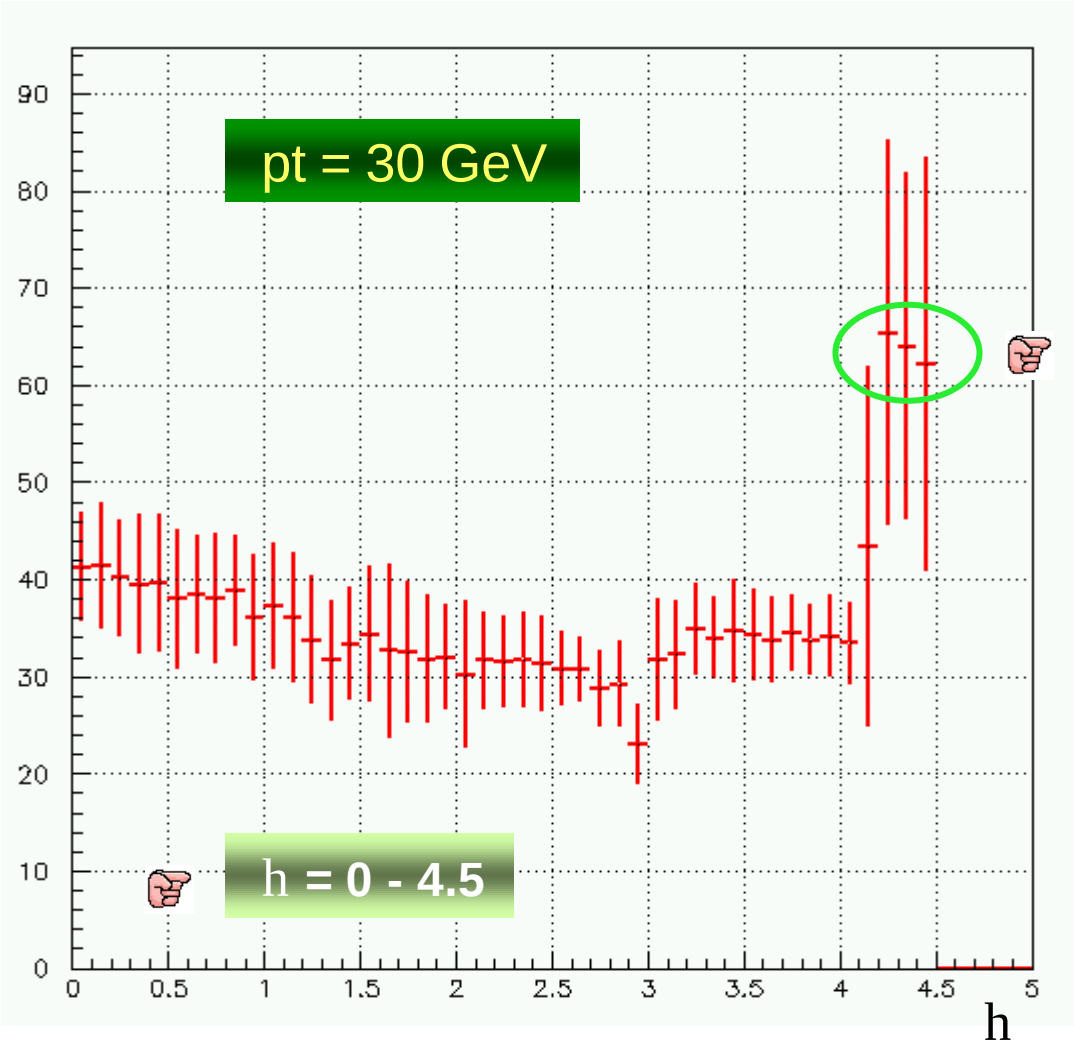


Single-p Shooting at HF (II)

☞ h = 3.88-3.92



Single-p Shooting …



- **No pileup**

Could be some confusion …

ORCA or CMSIM ?

- **Event-by-event analysis (single pions)**
  - Printout of RecHits from Ntuples :
    both HF layers contain too high signal,
    transverse profile (eta-phi) look OK …
  - Printout of SimHits at the “entrance”
    of ORCA (just after GEANT gfhits) : too much !
  - All steps of the signal evaluation in ORCA
    followed closely (printed) :
    what comes from fz file is treated properly
- **Evidence in favour of CMSIM origin …**
- **Finally CMSIM tests show problems with particles above 1 TeV …**

Simple(st) HF Filter

Reject those events with at least one stable particle with E > 1 TeV pointing to HF (signal/trigger event particles are available …)

HLT Data Filtering

		Low lumi			High lumi		
1)	0-15 * $\hat{P}$ < 15GeV	94802			95376		
2)	15-20	52000	3	51997	52000	3	51997
3)	20-30	52000	36	51964	52000	36	51964
4)	30-50	35804	154	35650	46610	198	46412
5)	50-80	146141	1337	144804	149250	1336	147884
6)	80-120	133497	1605	131892	99999	1207	98792
7)	120-170	147495	2204	145291	149495	2230	147265
8)	170-230	2000**	27	1973	2000**	27	1973
9)	230-300	19999	285	19714	19889	283	19616
10)	300-380	2259	31	2228	10000	107	9883
11)	380-470	10000	75	9925	10000	75	9925
13)	470-600	6650	33	6617	10000	51	9949
13)	600-800	2000	8	1992	2000	8	1992
14)	800-1000	2000	10	1990	2000	10	1990
15)	1000-1400	2000	9	1991	2000	9	1991
16)	1400-1800	1900	8	1892	2000	9	1991
17)	1800-2200	2000	4	1996	2000	4	1996
18)	2200-2600	2000	2	1998	1900	2	1898
16)	2600-3000	2000			2000		
17)	3000-3500	2000			1800		
18)	3500-4000	2000			2000		

Filtered out

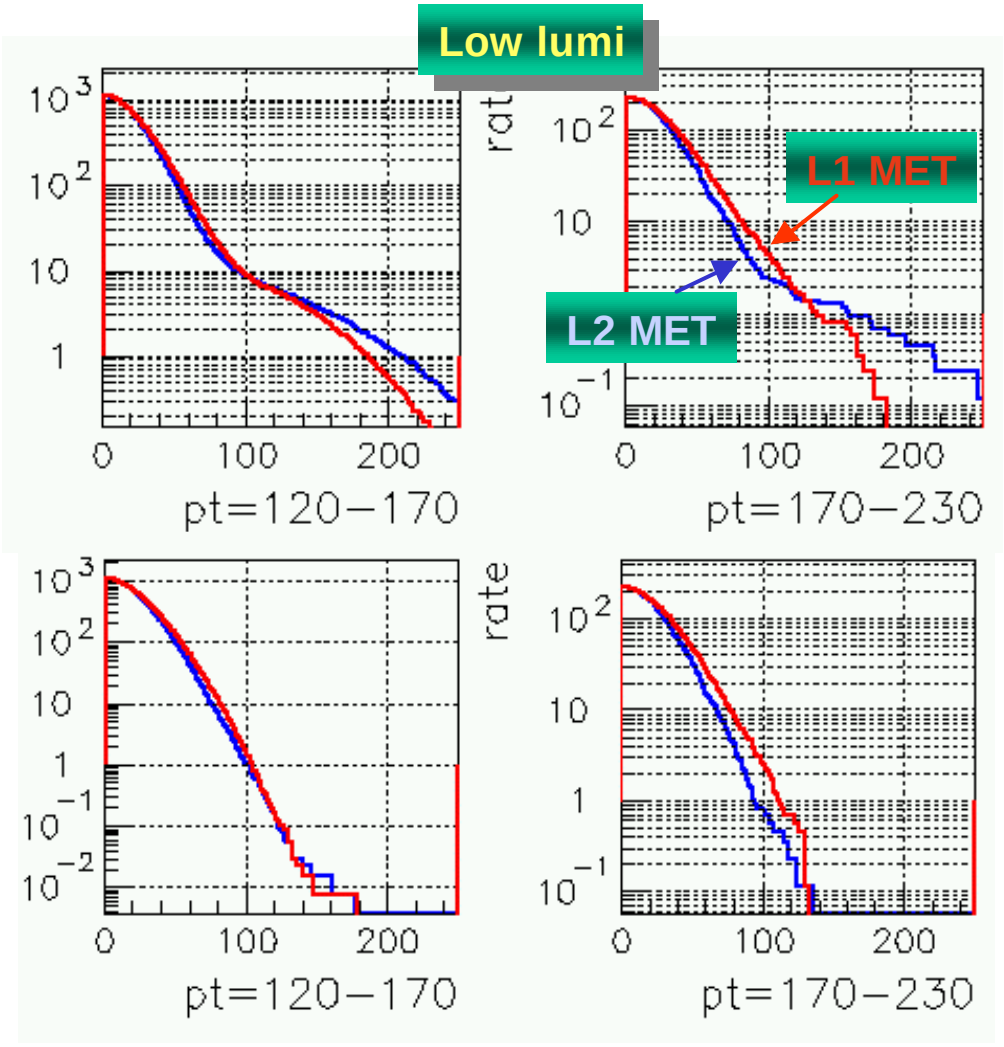
Filtered out

**Additional amout is being digitized

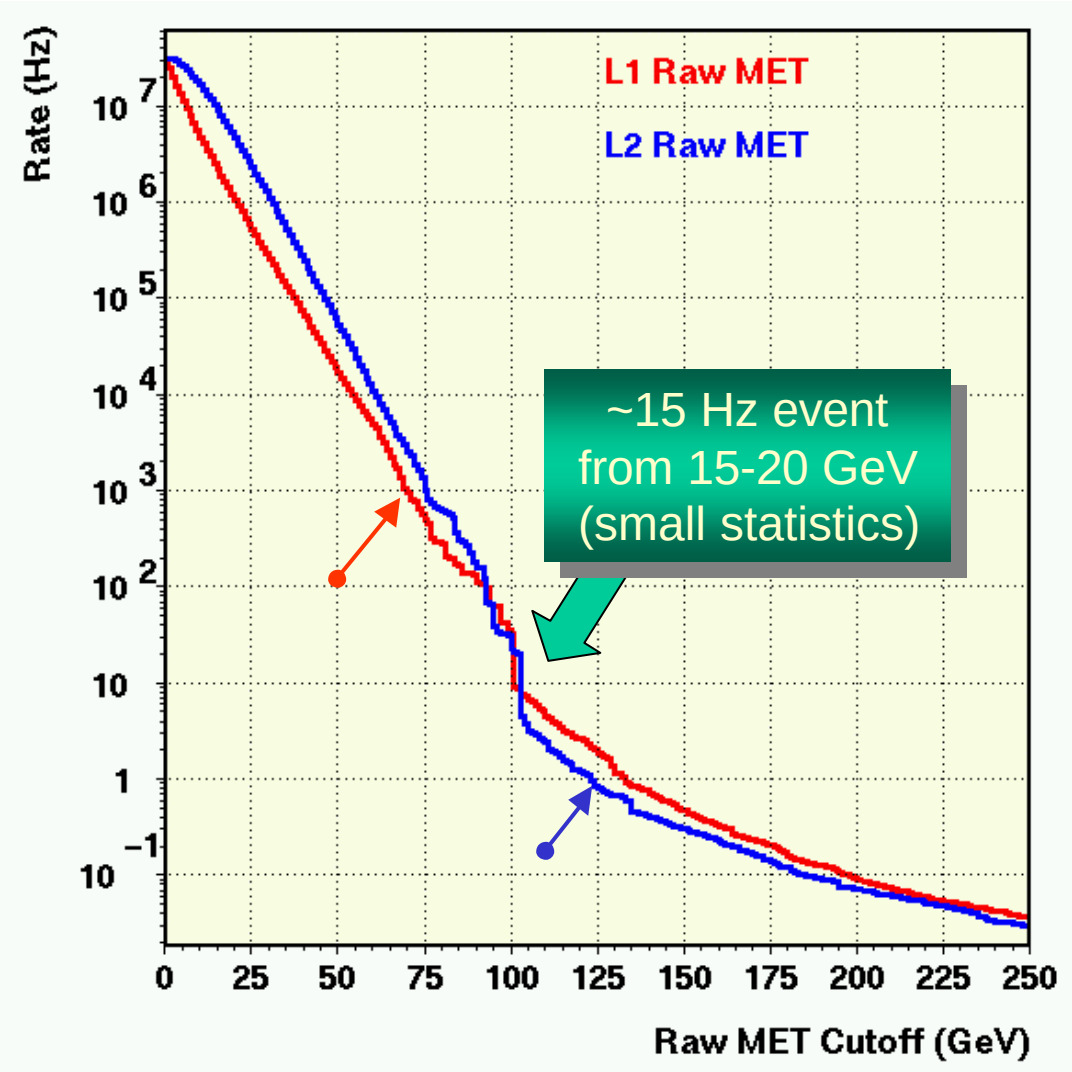
Filtering out the Tails ...

without filter

with filter



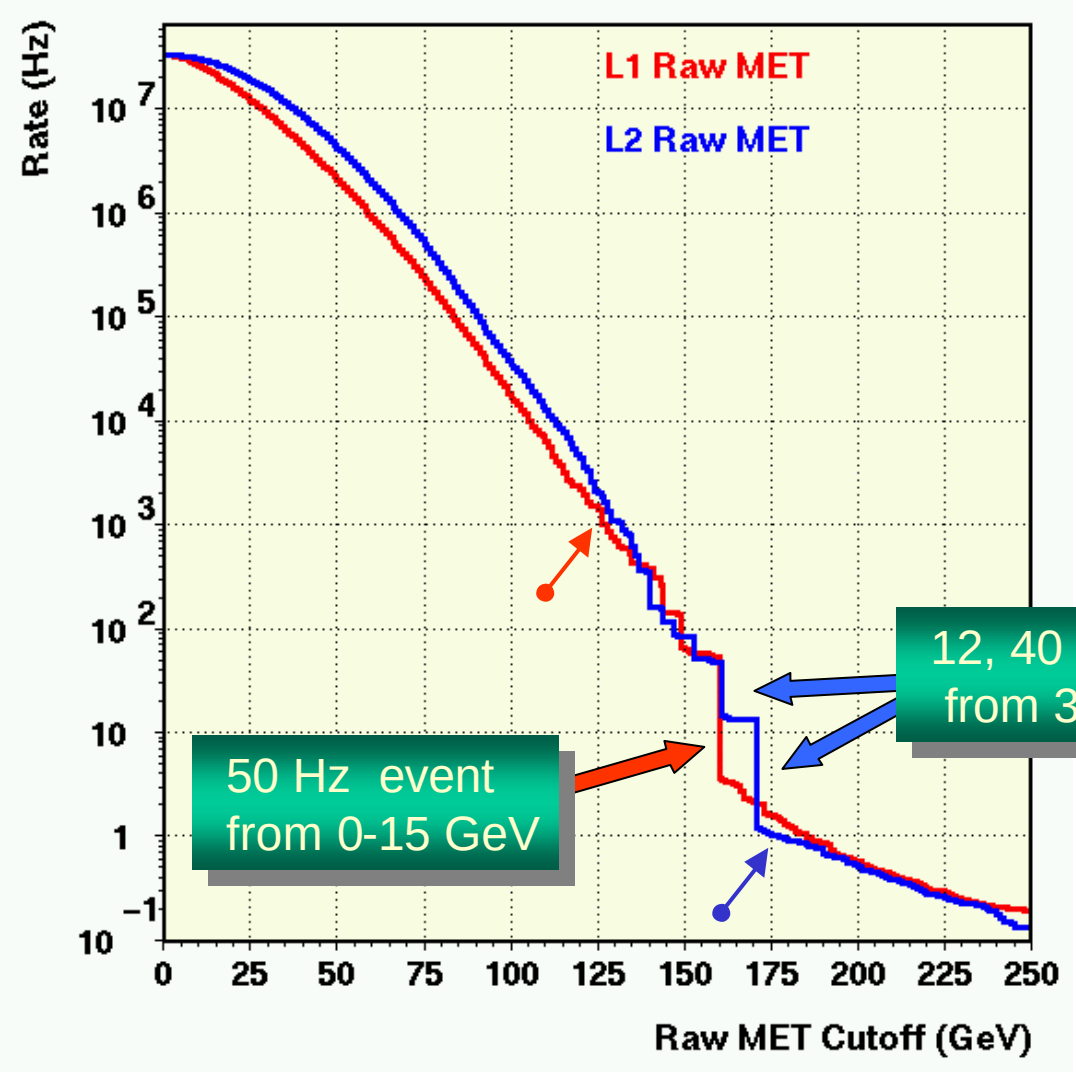
MET @ Low Luminosity



In 2002/015 (low lumi) :

- L1 MET rate ≅
  L2 MET rate = 1 kHZ
  at ~ 65 GeV
- Now at ~ 70-75 GeV

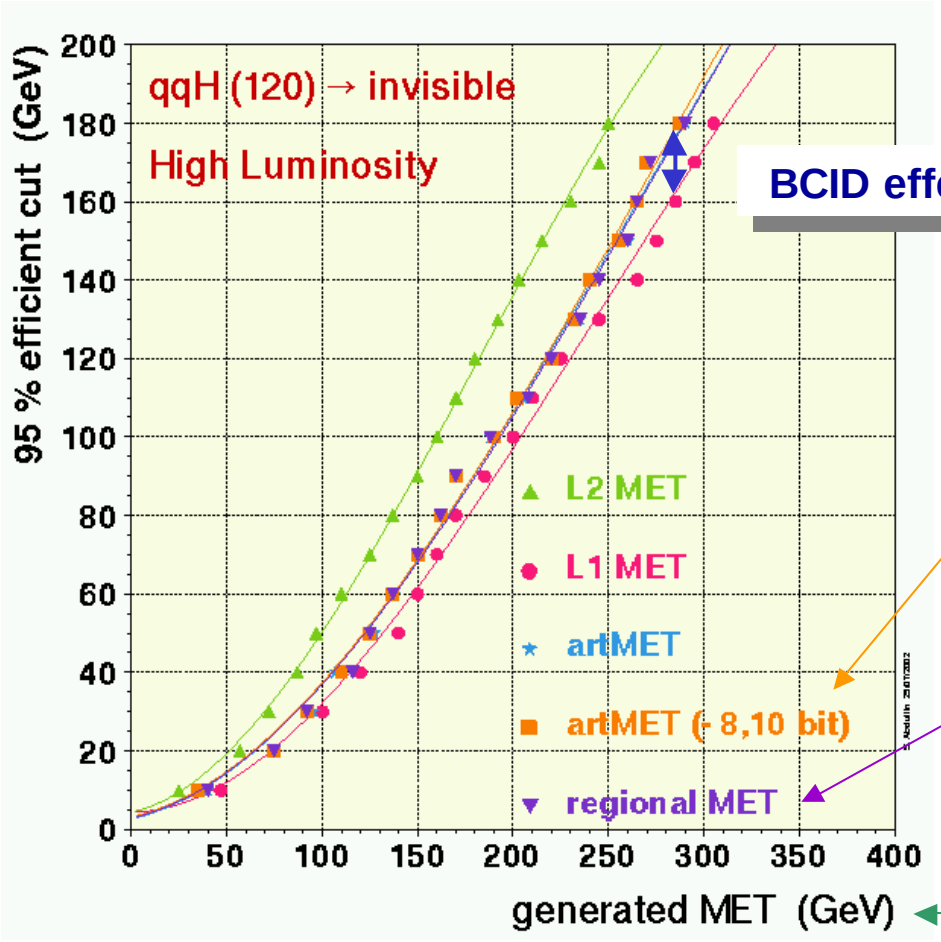
MET @ High Luminosity



- Low statistics !
- HF filter is not a panacea, unfortunately …

Invisible Higgs @ High Lumi (I)

- H(120) → invisible



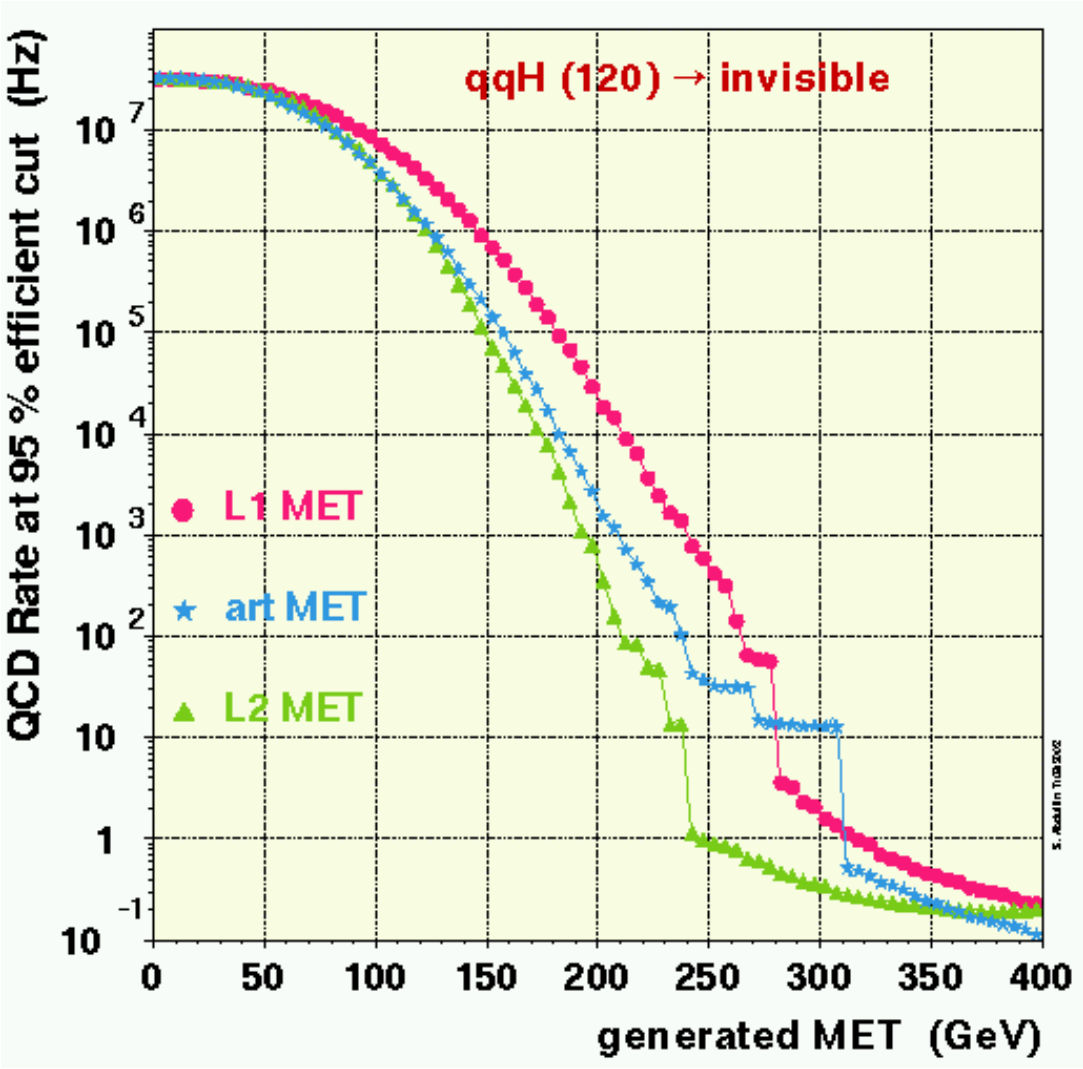
BCID effect ?

L1 granularity and LSB=1 GeV

All known tricks L2->L1 except BCID

Calo scope + μ (in-time)

Invisible Higgs @ High Lumi (II)



- no comments …

Remarks on HF Filter

```
*************************************************************************
      SUBROUTINE HF_FILTER(IRC)

*
* returns IRC = 0 if event is OK  (accepted)
*         IRC = 1 if event is BAD (rejected)
*
      IMPLICIT NONE
*..................................... GENPART
      INTEGER    NG_MAX
      PARAMETER (NG_MAX = 3000)
      INTEGER          NGENP, PID,          IP1,          IP2
      COMMON /GENPART/ NGENP, PID(NG_MAX), IP1(NG_MAX), IP2(NG_MAX),
     &                 ETGENP(NG_MAX), PHIGENP(NG_MAX), ETAGENP(NG_MAX),
     &                  MGENP(NG_MAX)
      REAL             ETGENP,          PHIGENP,          ETAGENP, MGENP

      INTEGER IRC
      INTEGER I, IST
      REAL    ETALIM1,        ETALIM2,        ENLIM,        ABSETA
      DATA    ETALIM1 /3.0/, ETALIM2 /5.0/, ENLIM /999./

      IRC = 1

      DO I = 1, MIN(NGENP,NG_MAX)
         IST = (IP1(I)-(IP1(I)/10000)*10000) / 100
         IF(IST.EQ.1) THEN
            ABSETA = ABS(ETAGENP(I))
            IF(ABSETA.GT.ETALIM1.AND.ABSETA.LT.ETALIM2.AND.
     &        (ETGENP(I)*COSH(ETAGENP(I))).GT.ENLIM)          RETURN
         ENDIF
      ENDDO
      IRC = 0

      END

*************************************************************************
```

Pal : changed packing
IP1 = vert + ist x 100 + idaug x 400

cited problems in PAW with I*4
(to pack more that 4,000,000)

Should be :
400)*400) / 100

- no daughters – no difference for stable particles (ist=1)
- above packing doesn't work for ist > 3 … (often)

this filter is not a panacea !!!