Damage of the Plug PMTs during a shot set-up

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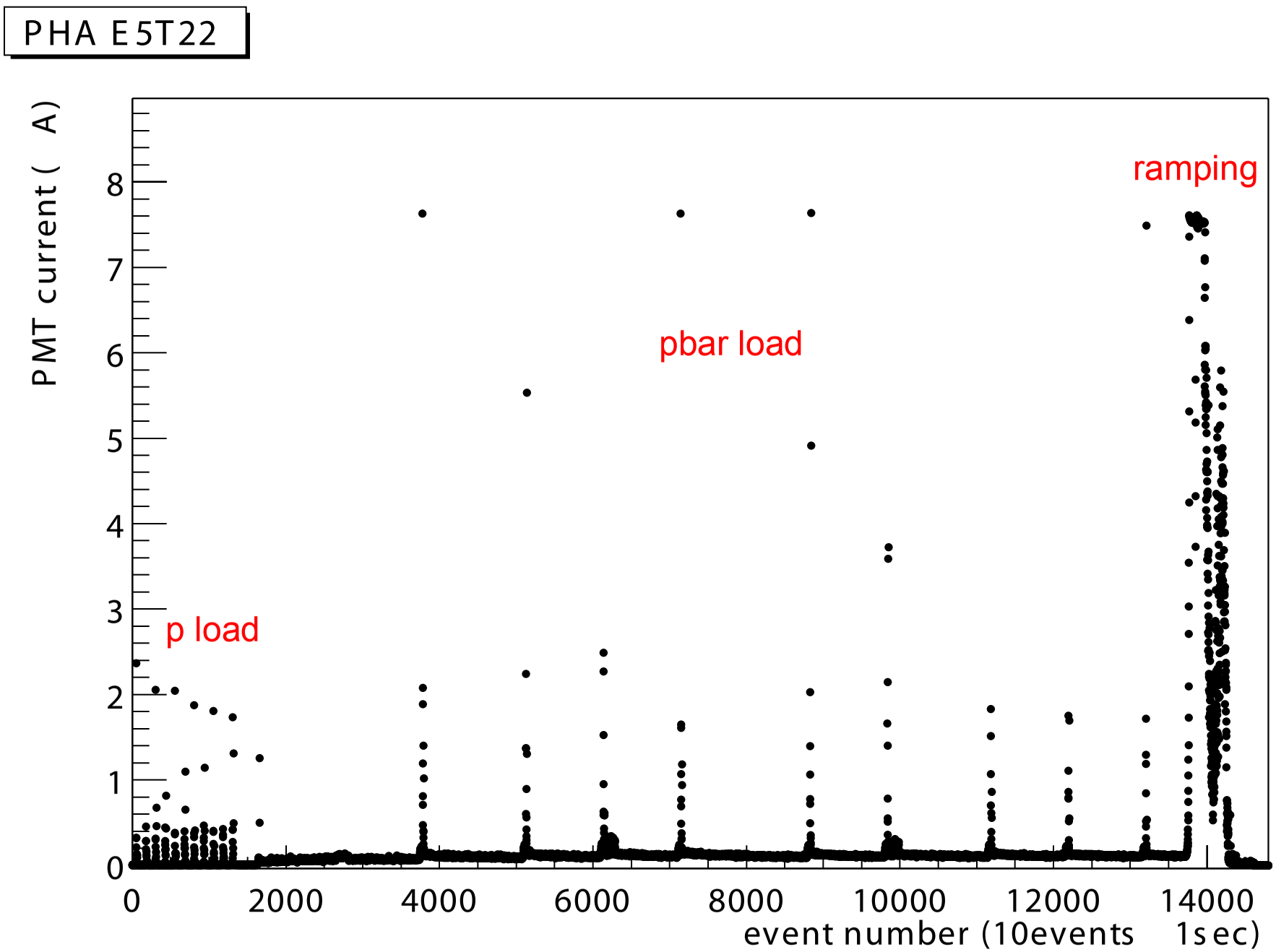
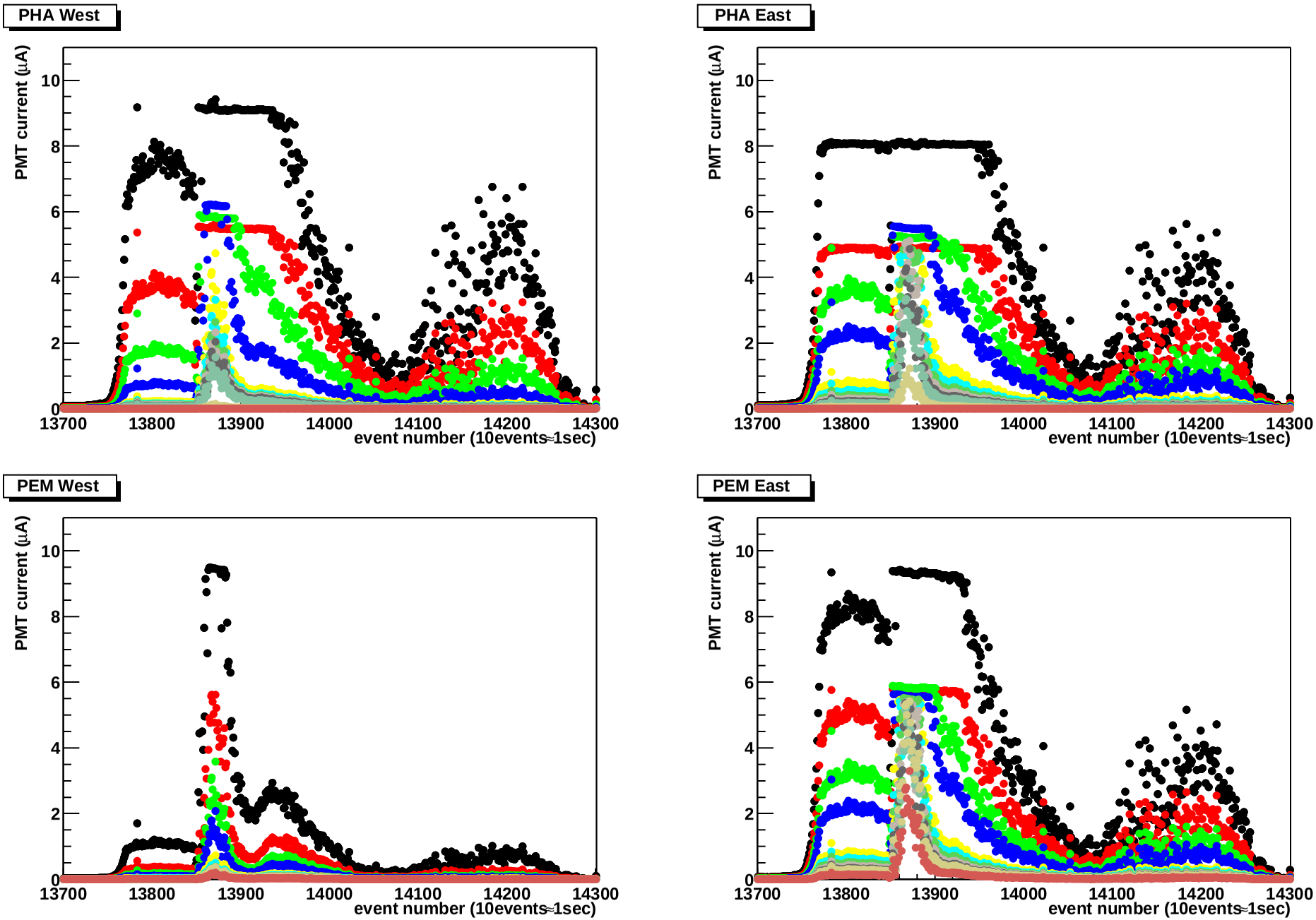
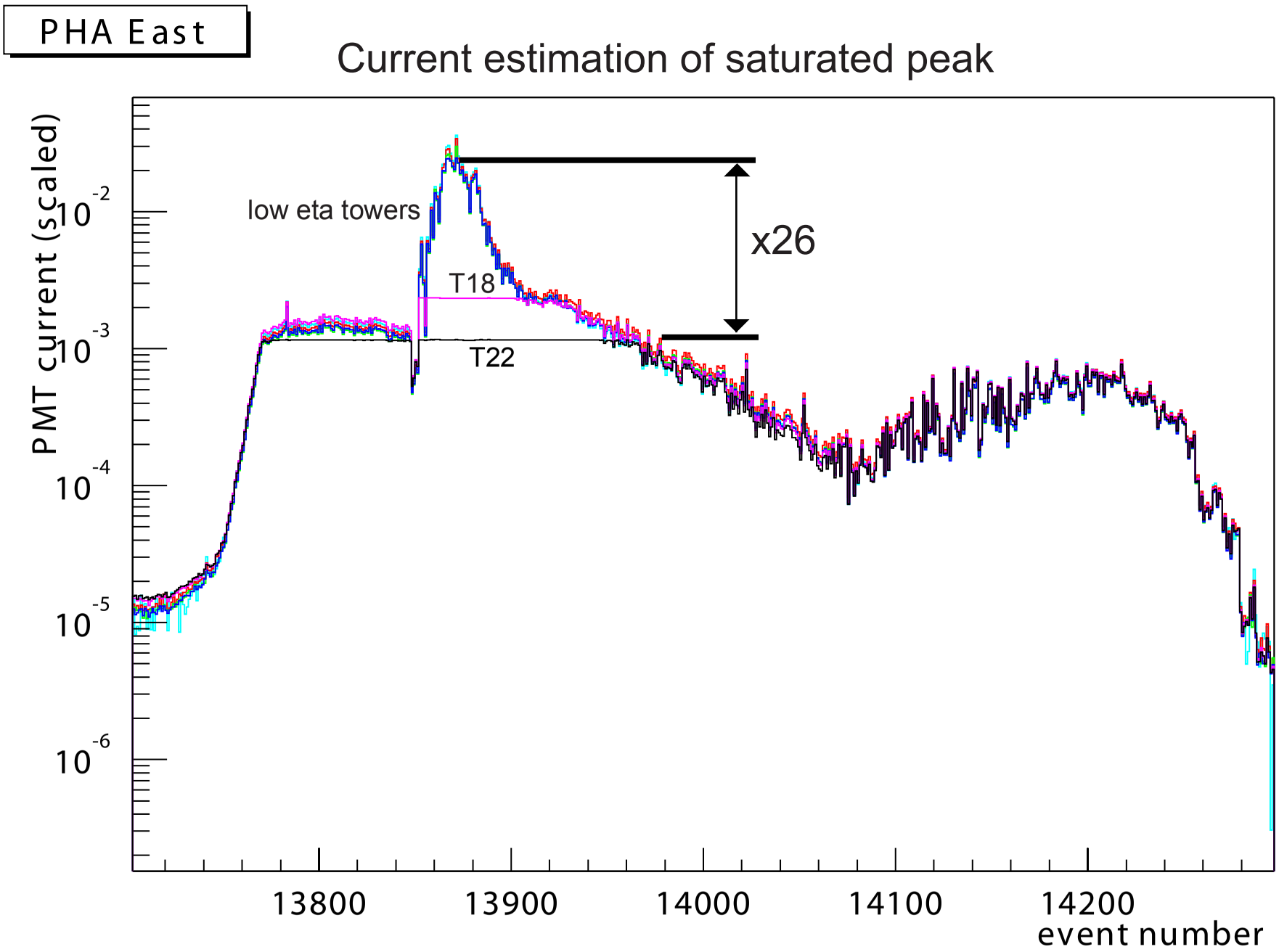
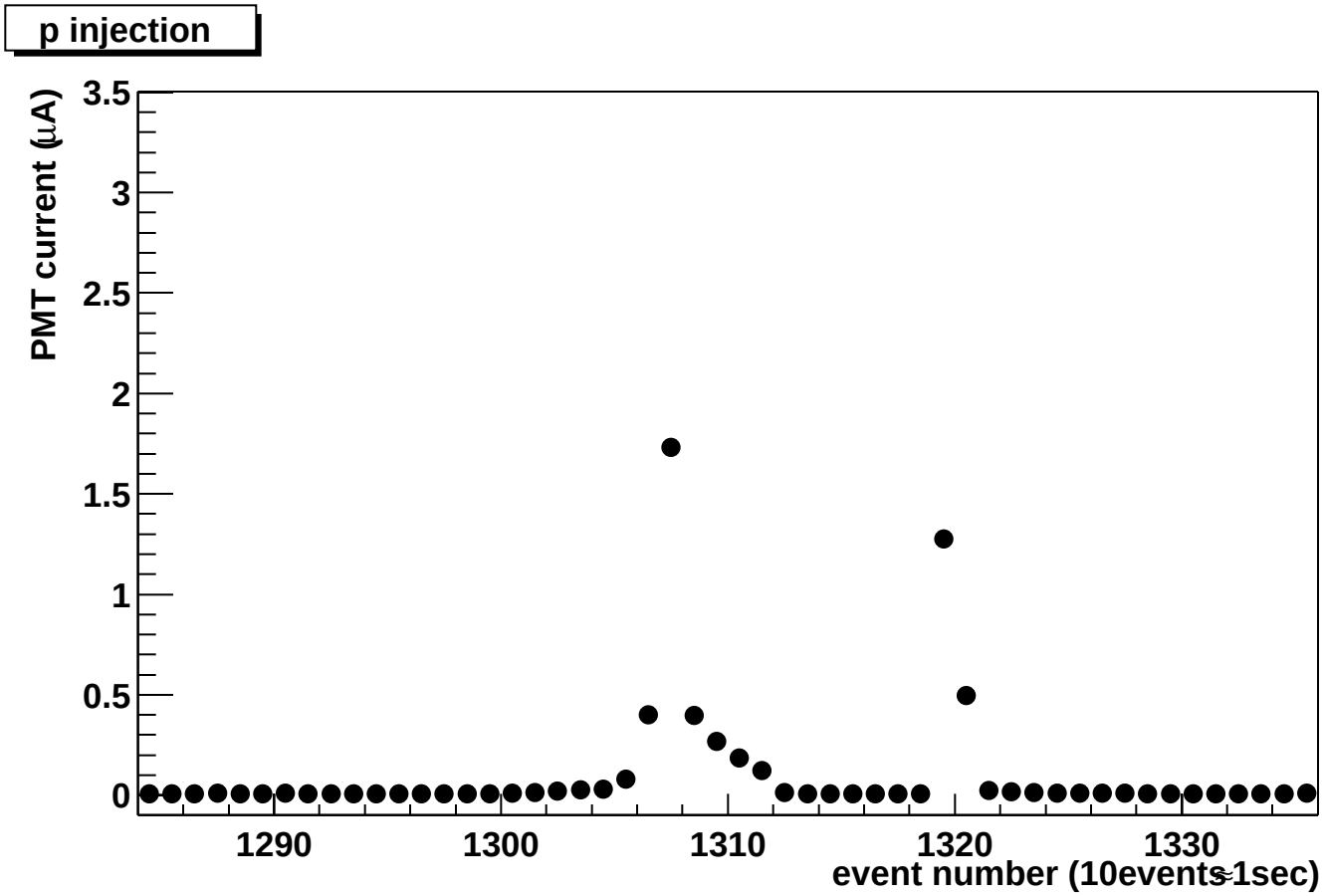
Jul-10 2002 Calorimeter meeting

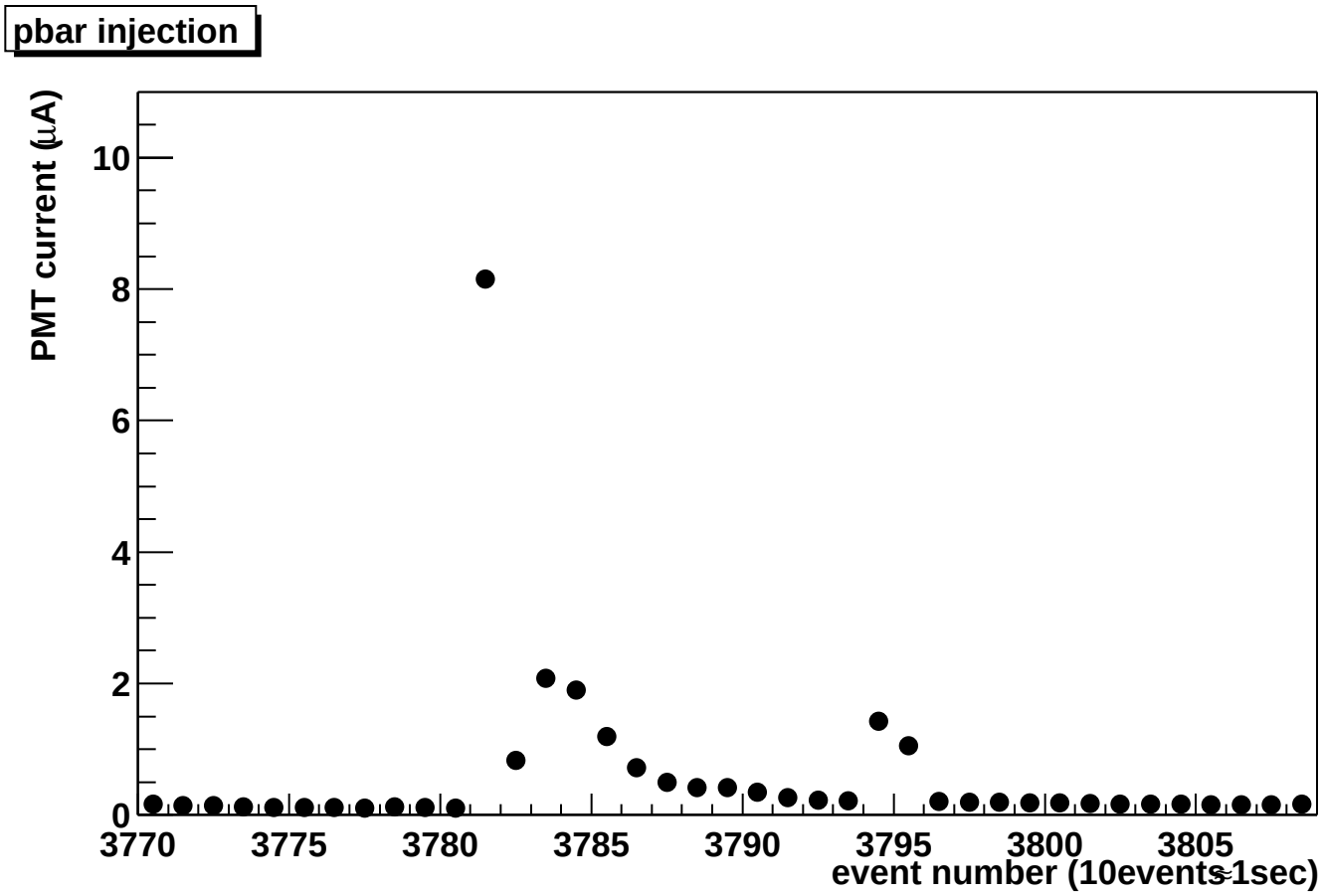
ADMEM current-mode data was taken during shot set-up (p load ~ ramping) for store 1499 (init lum = 22.4E30).
Run number : 147800


PHA E5T22
PMT current (A)
0
1
2
3
4
5
6
7
8
0
2000
4000
6000
8000
10000
12000
14000
event number (10events 1sec)
p load
pbar load
ramping


PHA West
PHA East
PEM West
PEM East
PMT current (μA)
event number (10events≈1sec)
0
2
4
6
8
10
13700
13800
13900
14000
14100
14200
14300


PHA East
Current estimation of saturated peak
PMT current (scaled)
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
low eta towers
T18
T22
x26
13800
13900
14000
14100
14200
event number


p injection
PMT current (μA)
3.5
3
2.5
2
1.5
1
0.5
0
1290
1300
1310
1320
1330
event number (10events≈1sec)


pbar injection
PMT current (μA)
10
8
6
4
2
0
3770
3775
3780
3785
3790
3795
3800
3805
event number (10events≈1sec)

Summary

PMTs of PEM, PHA should be damaged during shot set-up (especially ramping).

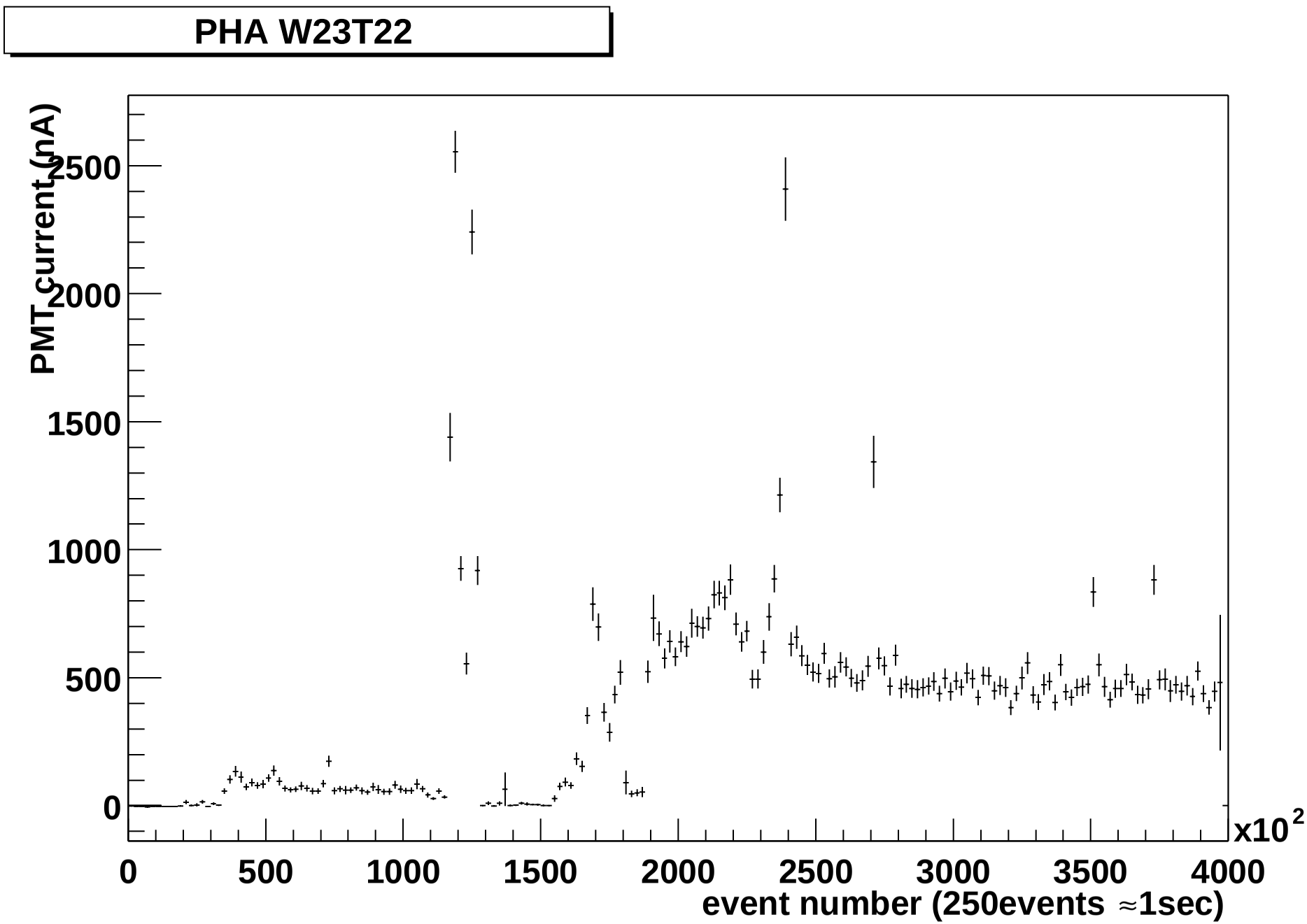
We should turn off the HVs during this period.

some issues not understood

PMT current during scraping ?
... we need to take current-mode data during scraping

Damage is same for every shot set-up?

PMT current vs beam loss ?


PHA W23T22
PMT current (nA)
2500
2000
1500
1000
500
0
x10^2
0
500
1000
1500
2000
2500
3000
3500
4000
event number (250events ≈1sec)