PMT Uniformity

For third scan uses older amplifiers for channels 1-48 – lower gain (40 x) better match to Hamamatsu large pulses.

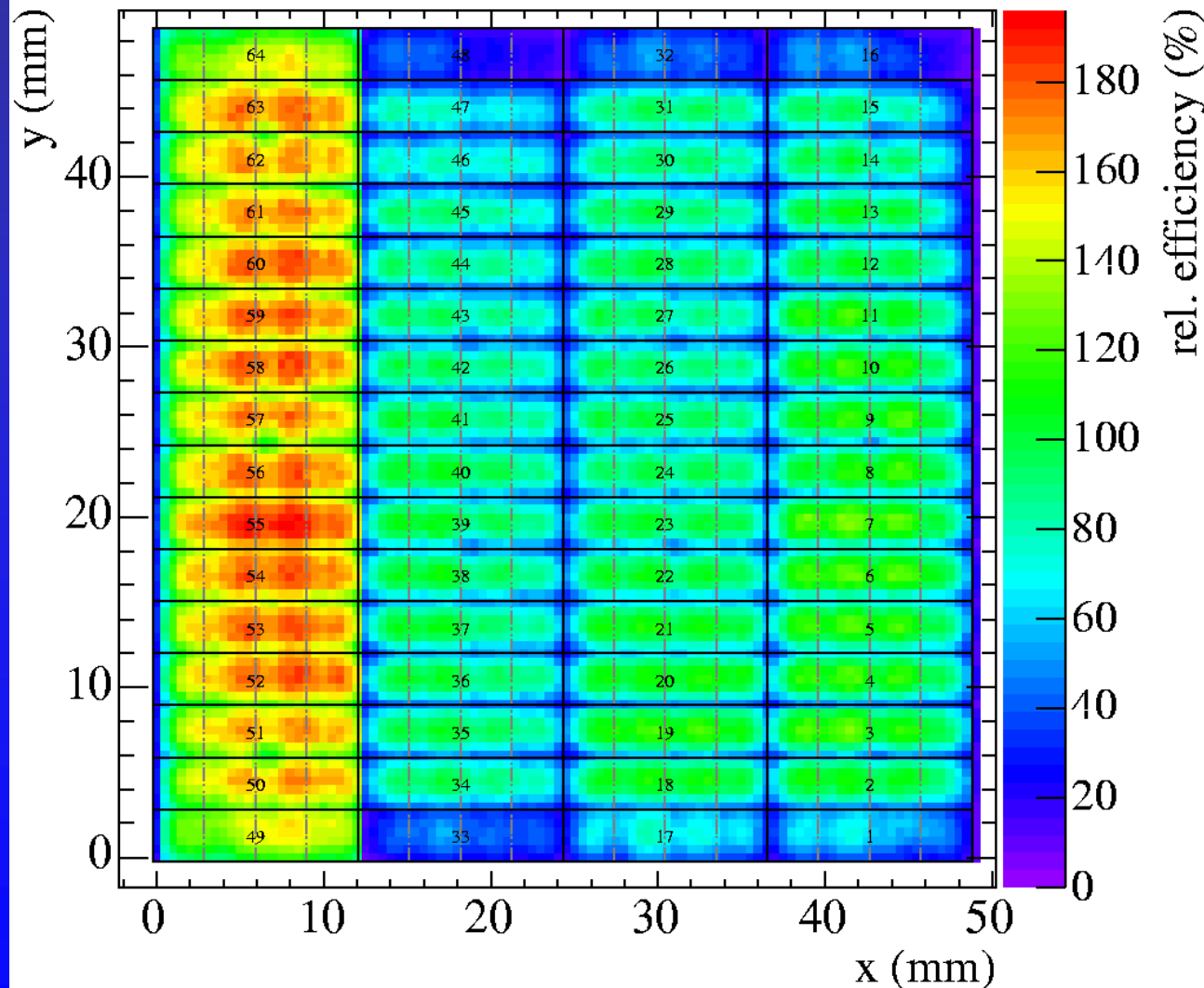Clean time peaks, rel. efficiency around 80-120%.

New (120x) amps for ch 49-64.

New amps result in 50% higher efficiency

But: new amps bring back side peaks in timing distr.

Third scan with fine grid (0.50mm*0.50mm scan); PMT at -1000V

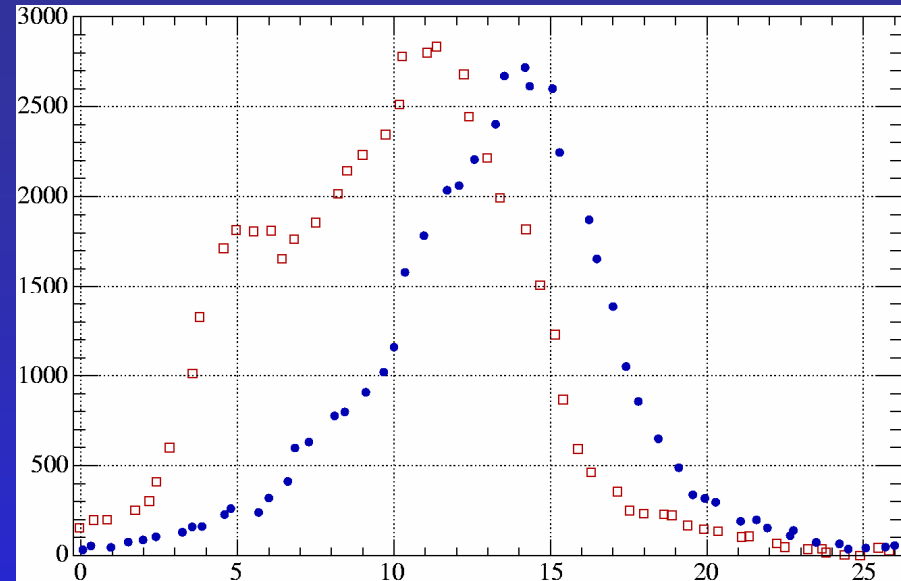Efficiency w.r.t. Photonis PMT, FP 256, 1.0kV, 20060305

Charge sharing / crosstalk
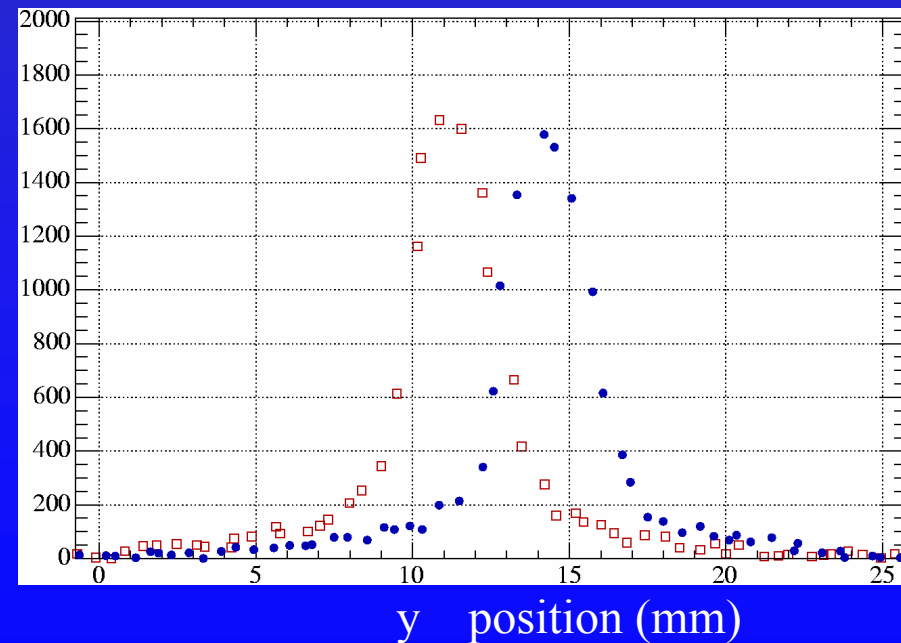
a lot of signal induced in neighbor pads
    with new amps at -1000 V

new amps
pad 55/56

old amps
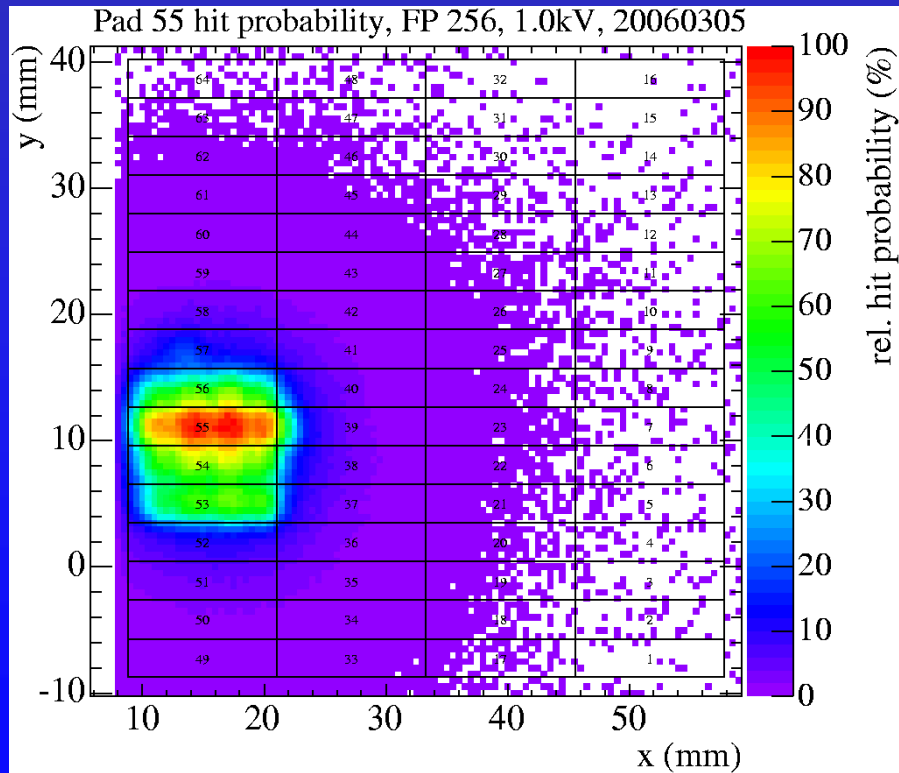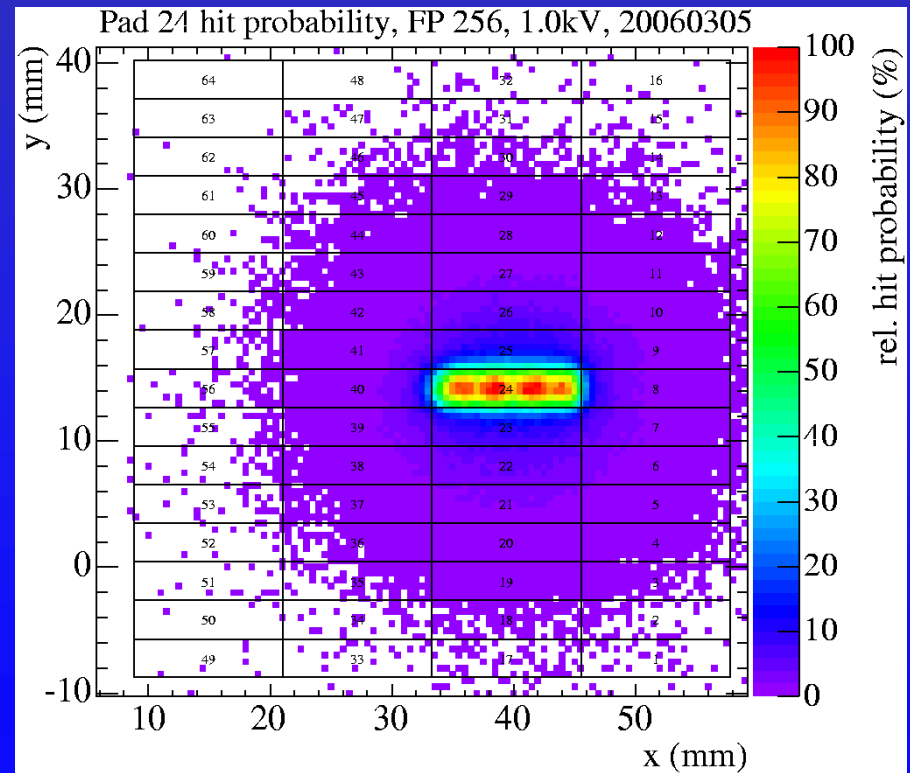pad 23/24

y   position (mm)

Charge sharing / crosstalk

a lot of signal induced in neighbor pads
    with new amps at -1000 V

new amps
pad 55

old amps
pad 24

multiplicity

Ivan has new (final) ROOT ntuple
    for beam position 1

→ nice agreement
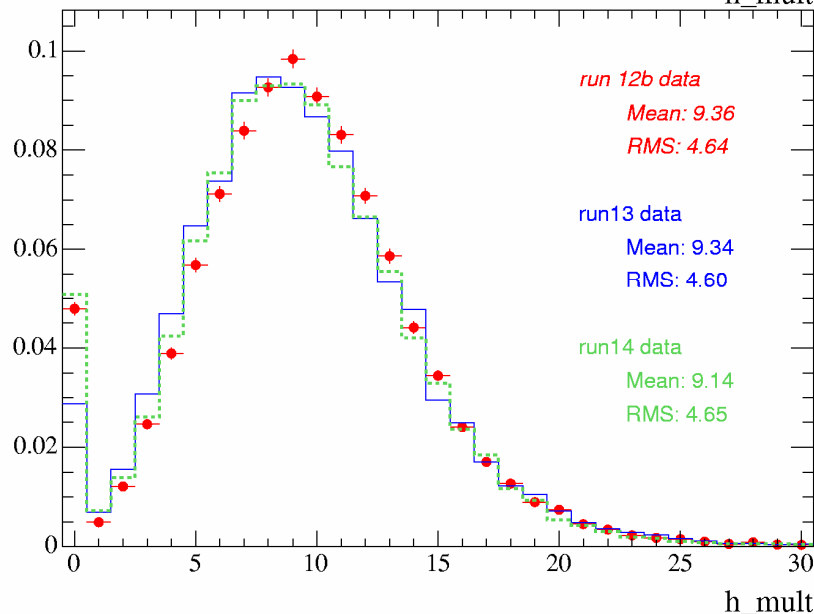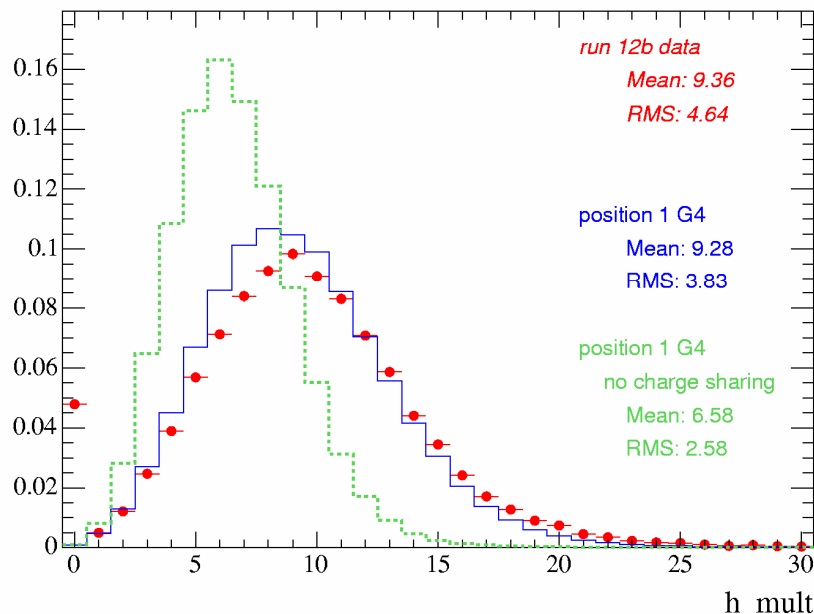
<div style="text-align:center">

run12
vs.
GEANT4
</div>

Comparison of multiplicity for
    different beam positions

→ photon yield pretty much constant

<div style="text-align:center">

run12
vs.
13&14
</div>

hit multiplicity, good events

"Epsilons"

Determined new epsilons
using Ivan's latest variable
lambda kBar angles
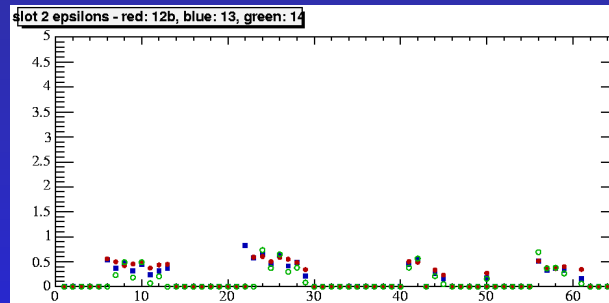
Fit measured minus expected
hit time with Gauss + constant

Mean of Gauss = epsilon

Process run 12b, 13, and 14
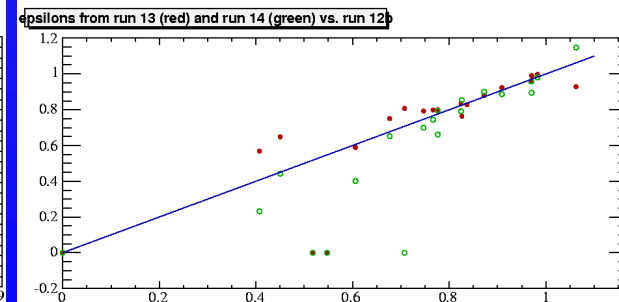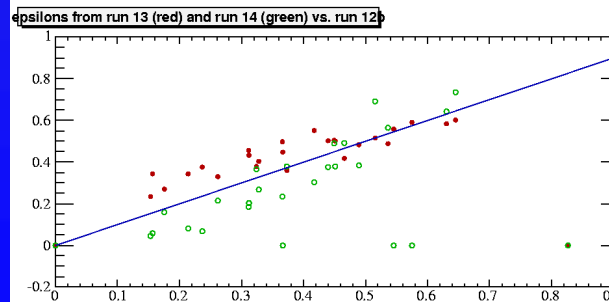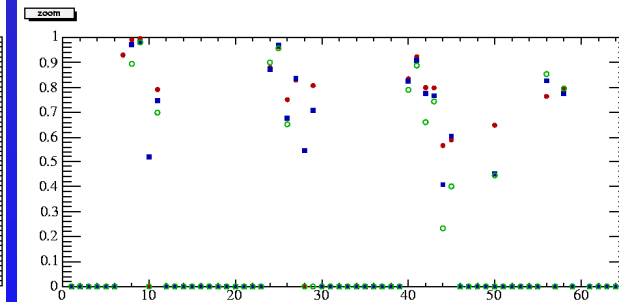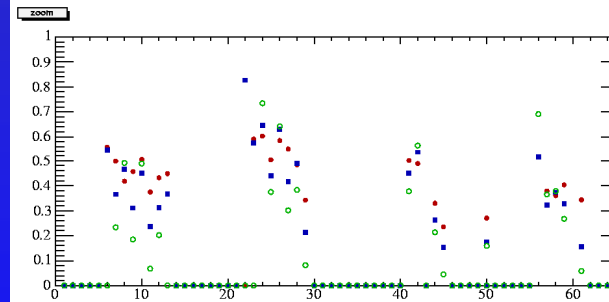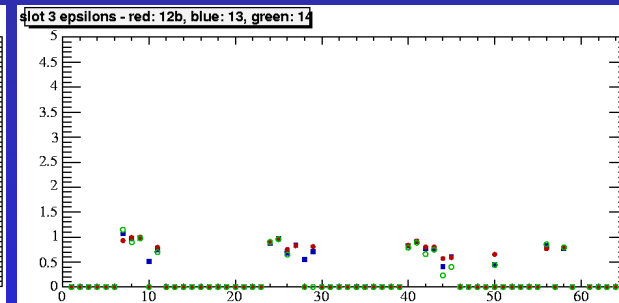
Showing only peak 1 today.

Compare epsilons in all slots/pads
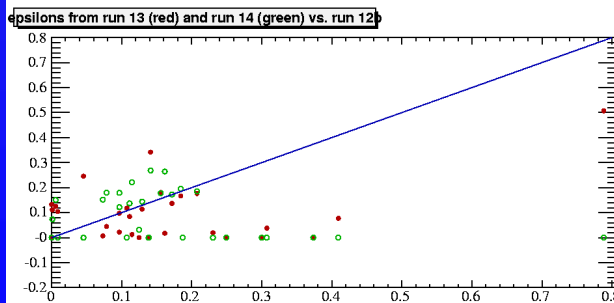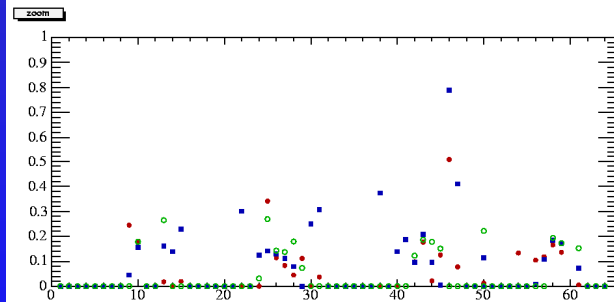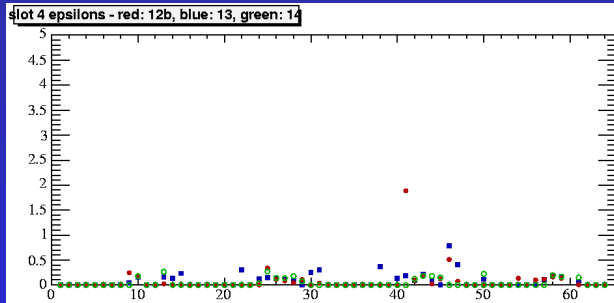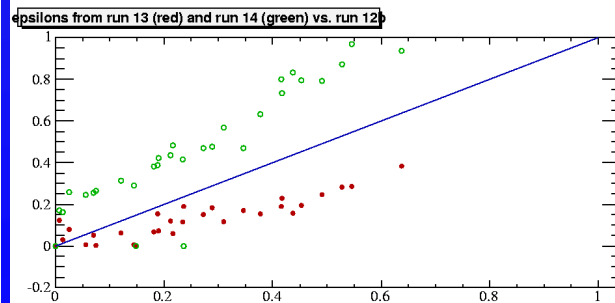
epsilons for most pads
  are 200-600ps

slot 2

slot 3

Epsilons continued
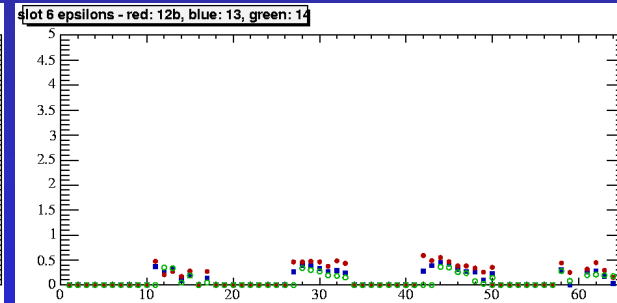
slot 4   slot 5   slot 6
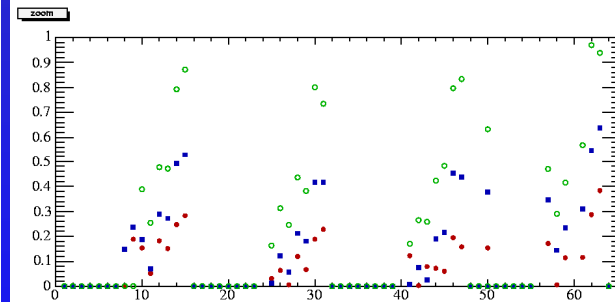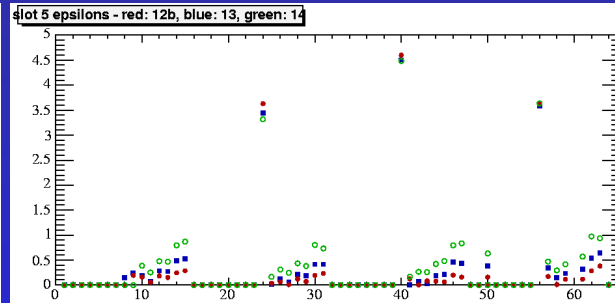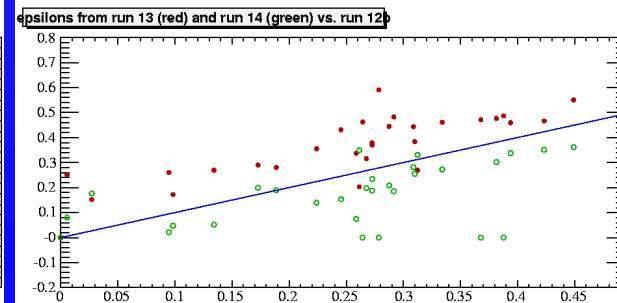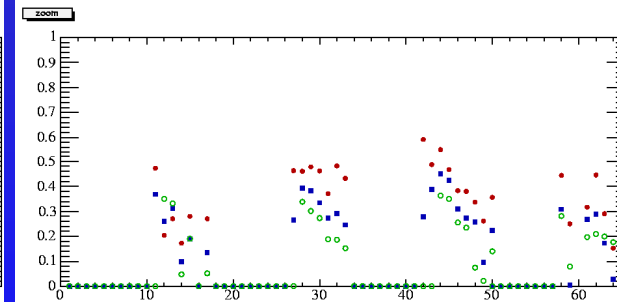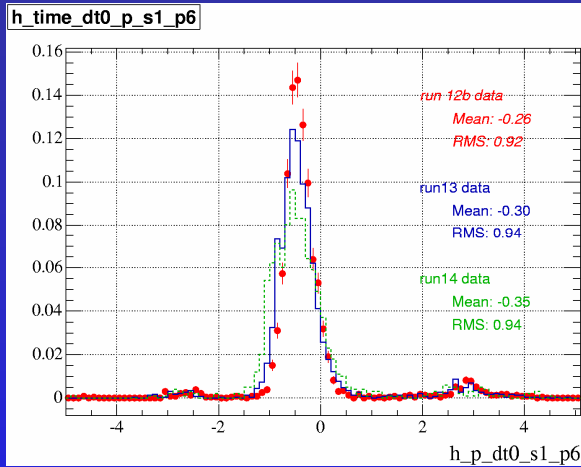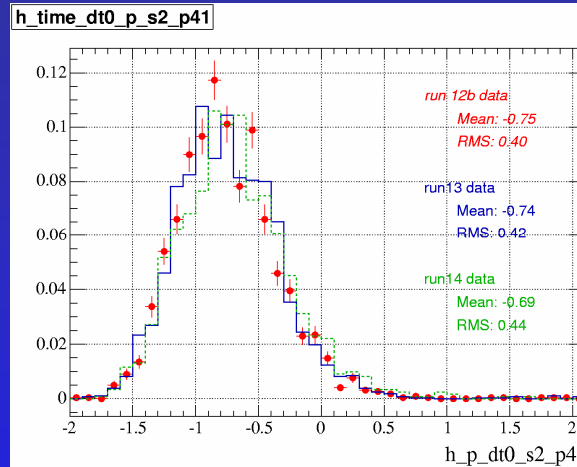
Epsilons continued   *(showing time peaks without fits)*

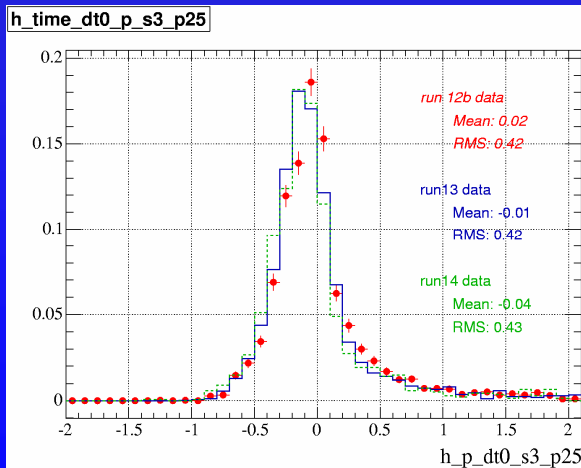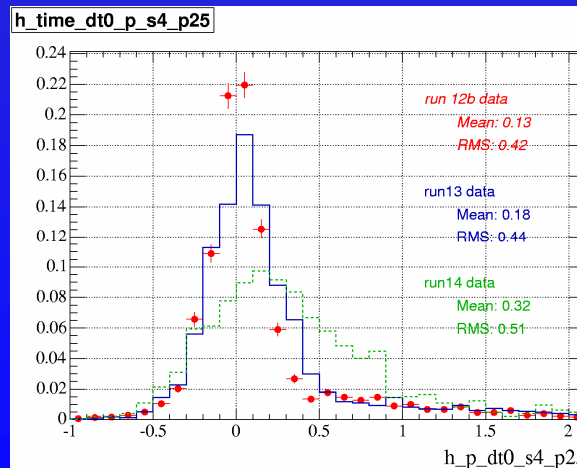slot 2   slot 3

Slot 5 shows more path
dependence then the
other slots

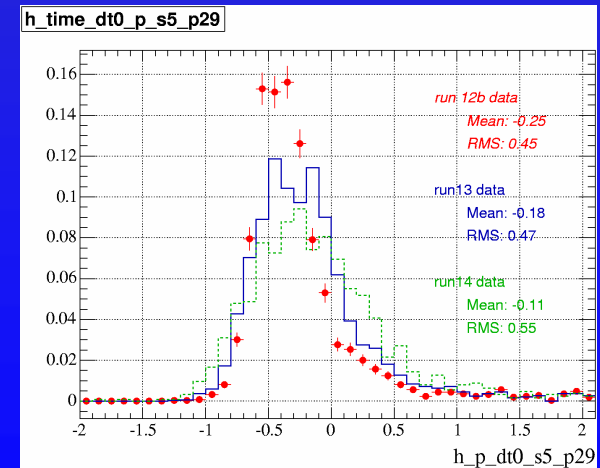*(silly notation: s4_p24 means slot 5, pad 35)*
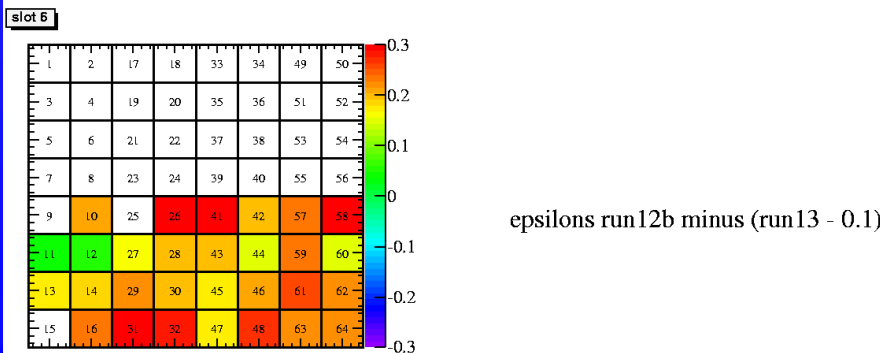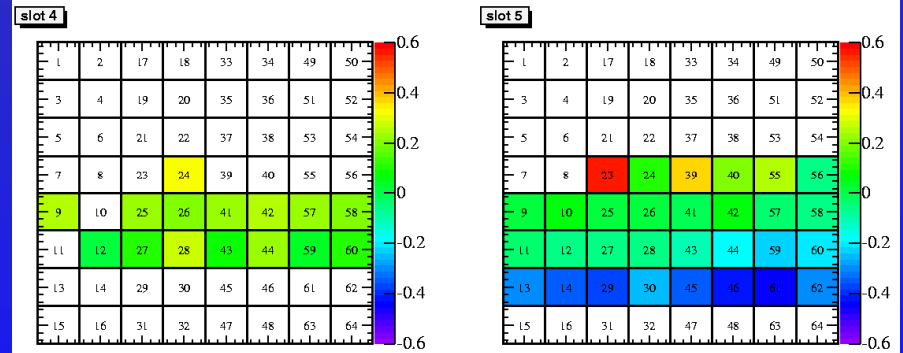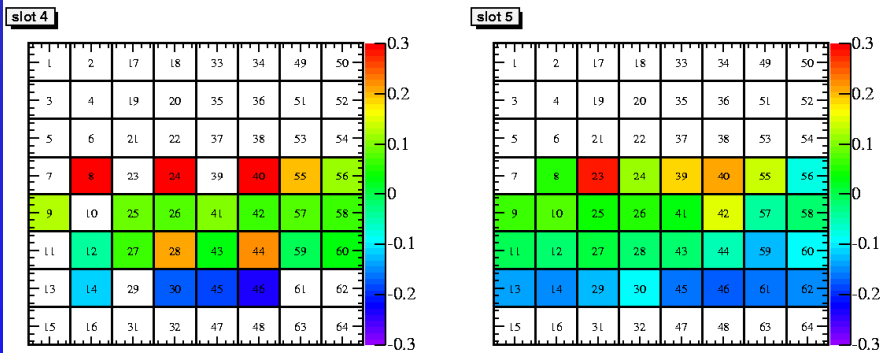
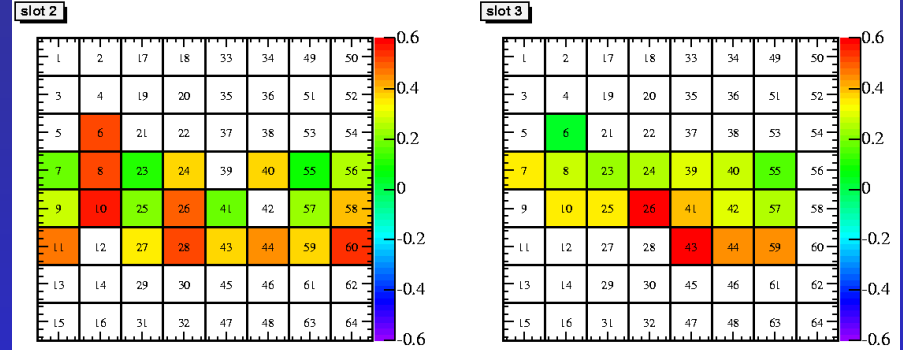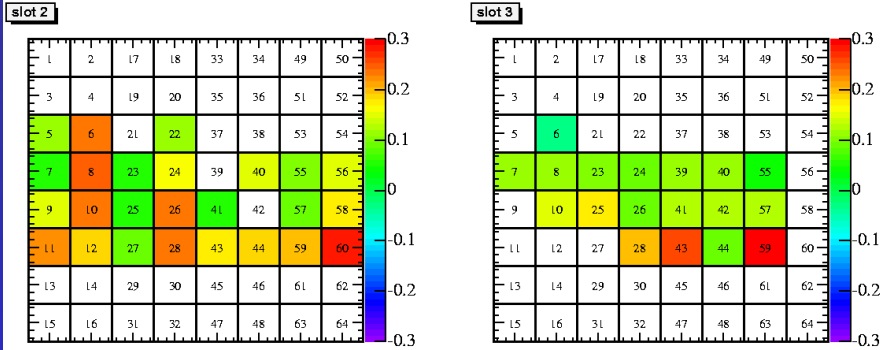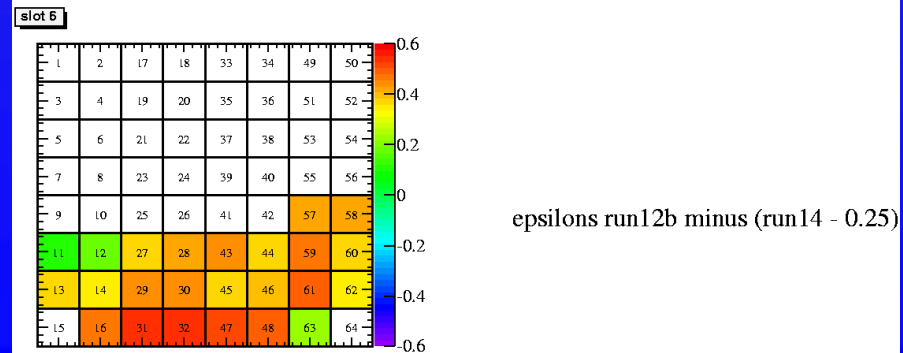slot 4   slot 5   slot 6
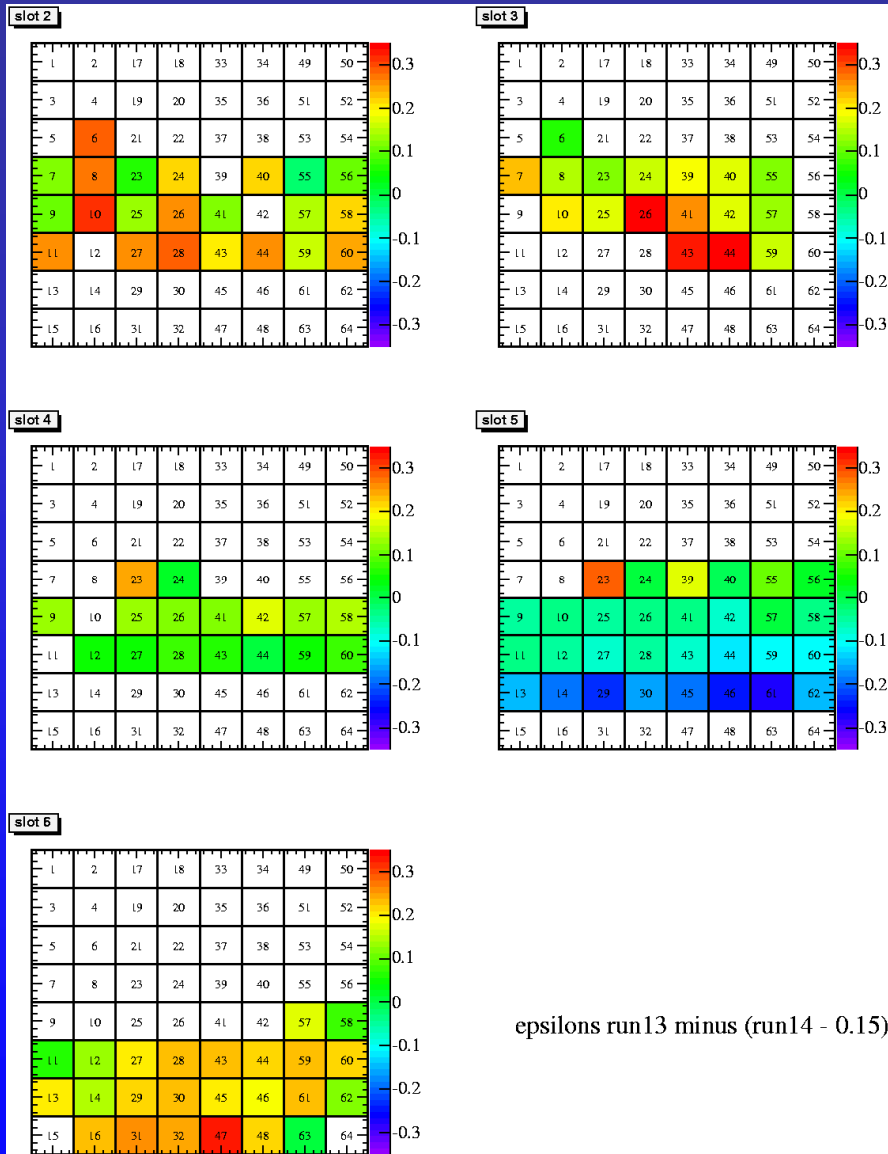
run 12b compared to 13 and 14, constant offset subtracted

epsilons run12b minus (run13 - 0.1)

epsilons run12b minus (run14 - 0.25)

run 13 compared to 14, constant offset subtracted

The "epsilons" appear to change with beam position at the level of 100-200ps

Since the peak positions vary between runs this is not unexpected if epsilons indeed correct for calibration limitations

(The simulation predicts the same kBar values for all beam positions.)

Next: run analysis with position-dependent epsilons for all beam positions.

epsilons run13 minus (run14 - 0.15)