Reconstruction of HR1 events taken in test beam

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EUDET Elec/DAQ meeting

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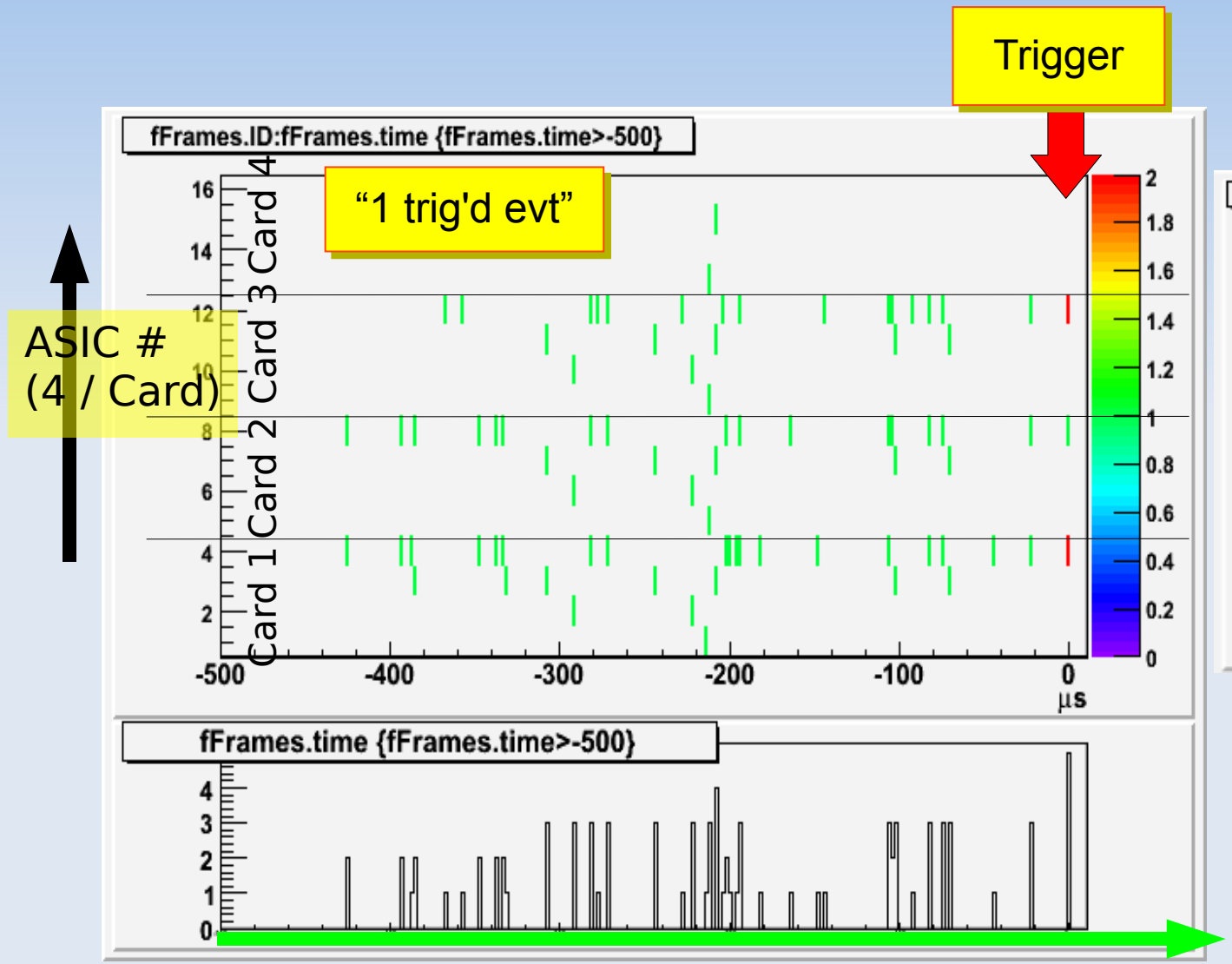
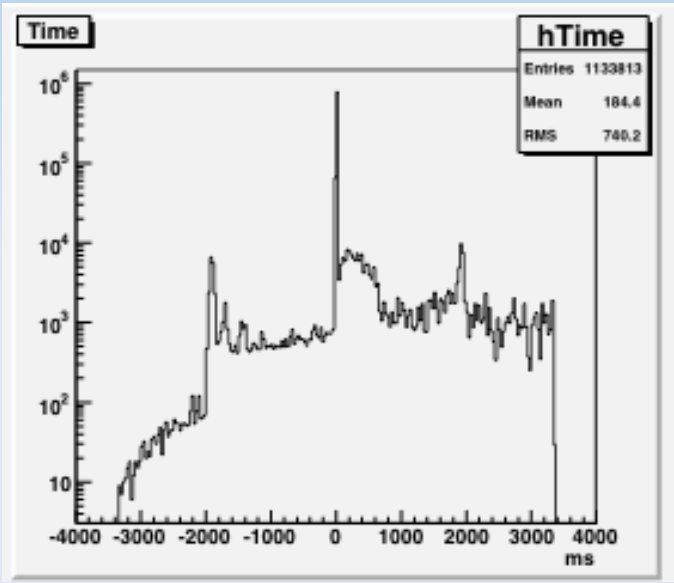
DESY

ÉCOLE POLYTECHNIQUE

1 event history

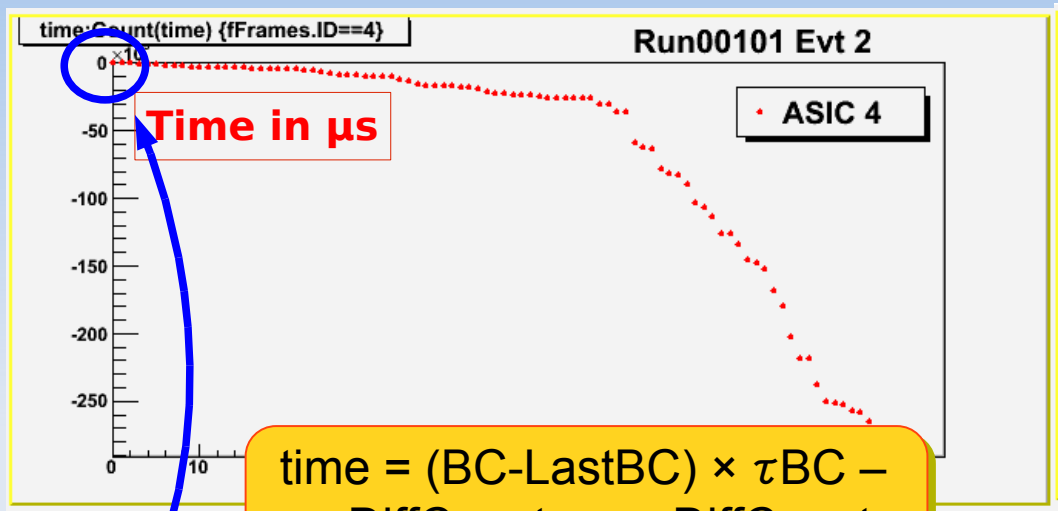


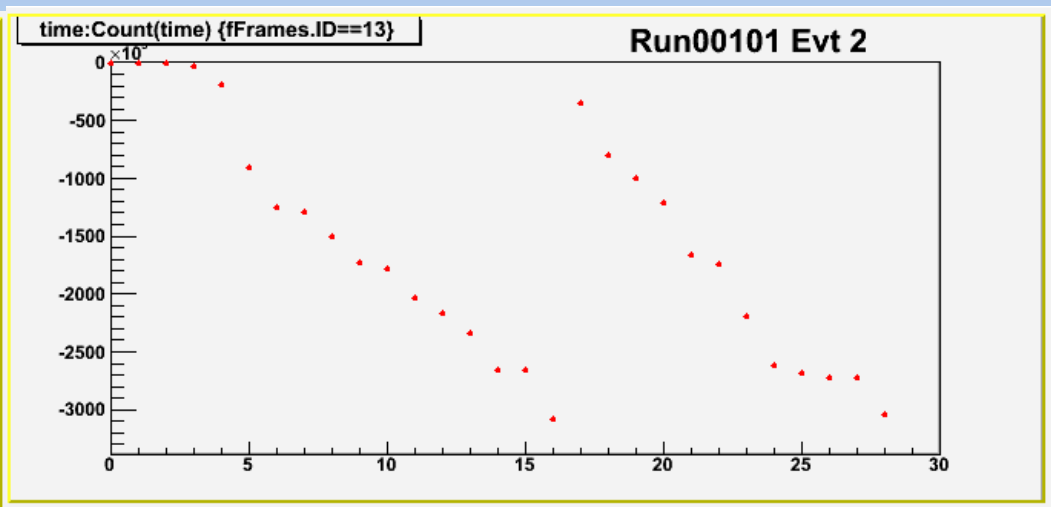


Synchronisation on ext. trigger

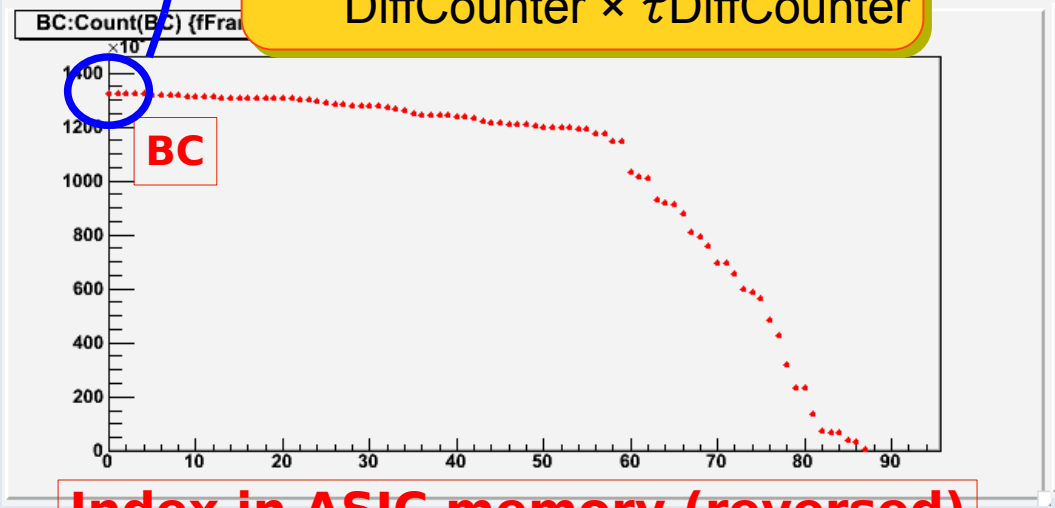
time = (BC-LastBC) × τBC – DiffCounter × τDiffCounter

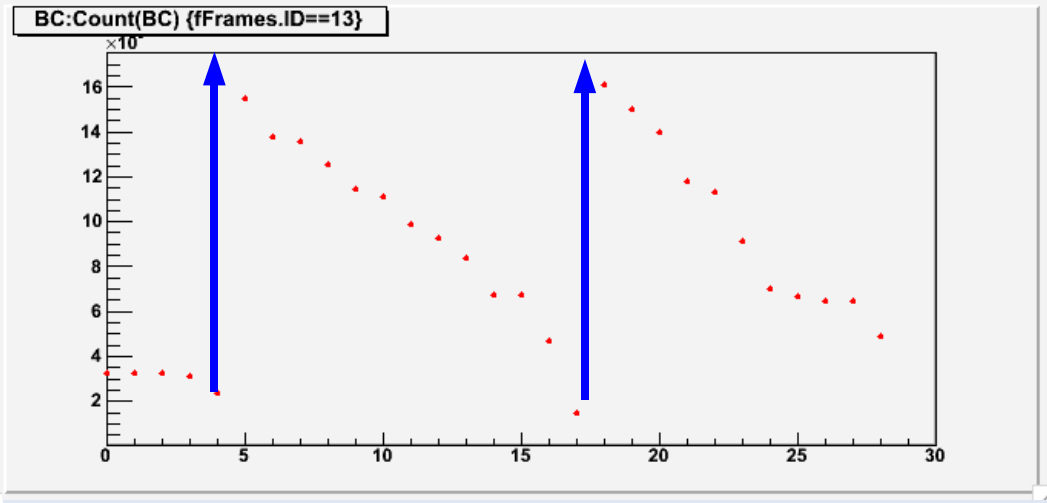
1 ASIC History reconstruction





time = (BC-LastBC) × τBC – DiffCounter × τDiffCounter

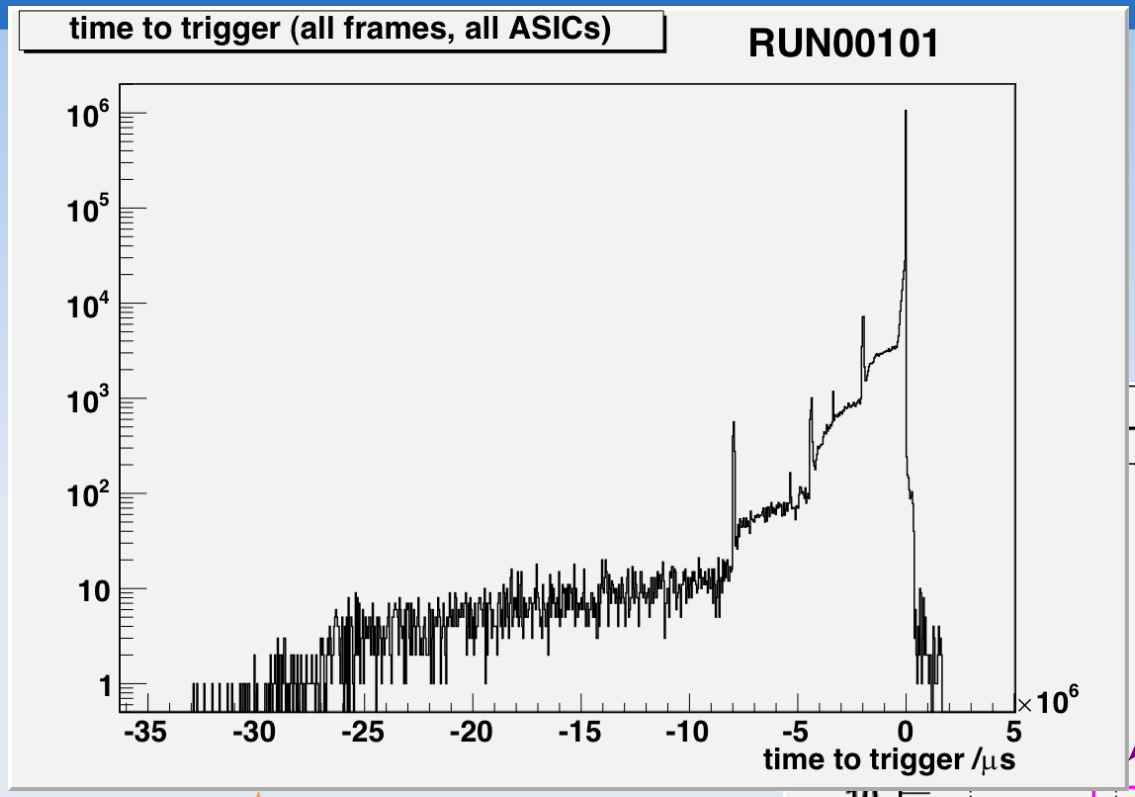




Index in ASIC memory (reversed)

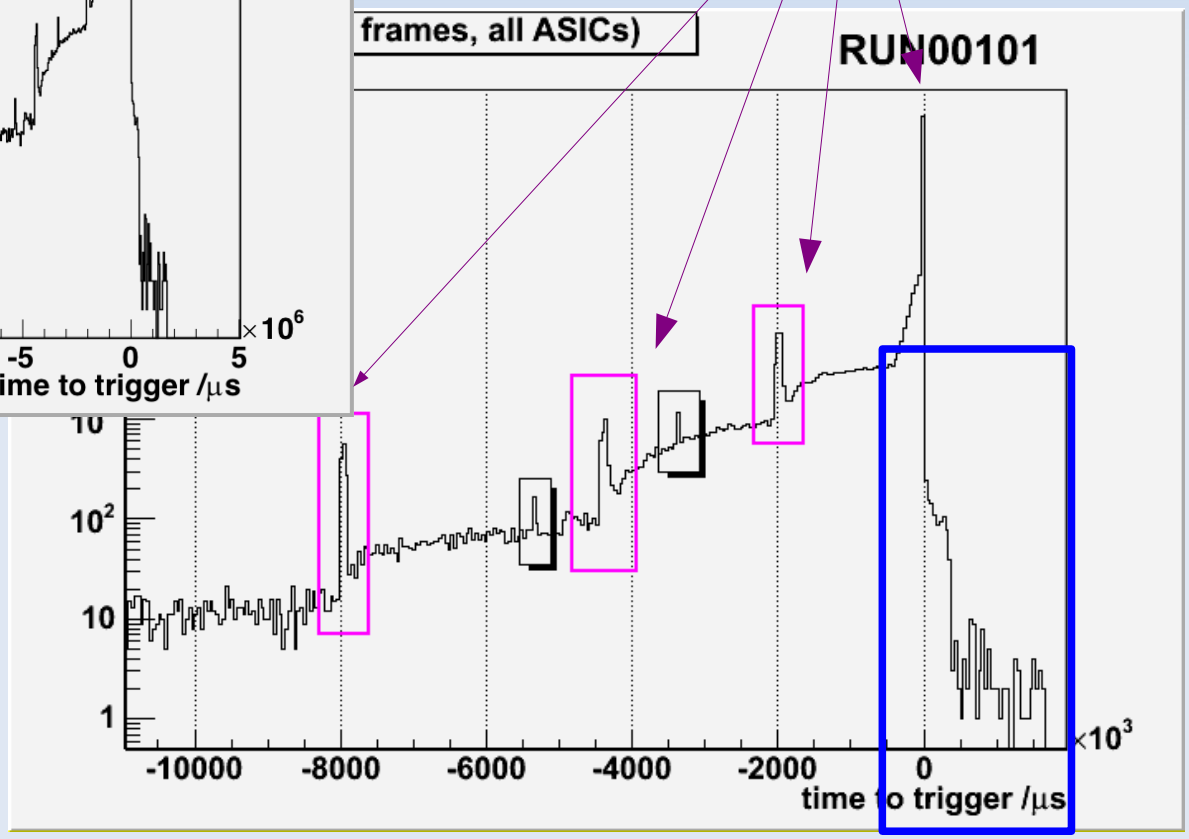
Counter overflow ~ 3s
(2^{24} × 200ns)

Full rec. spectrum

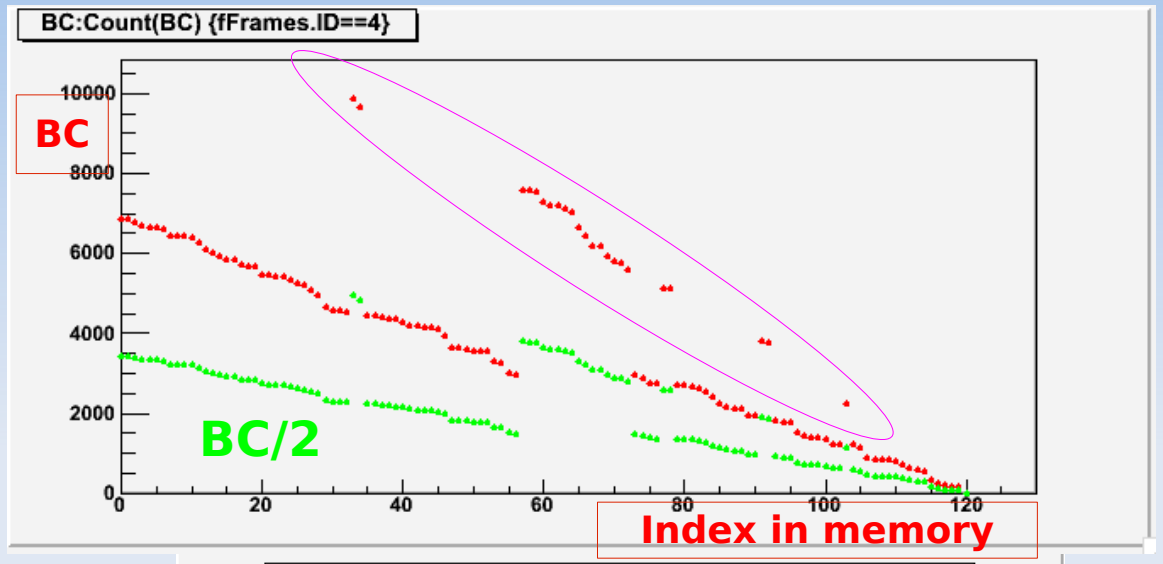


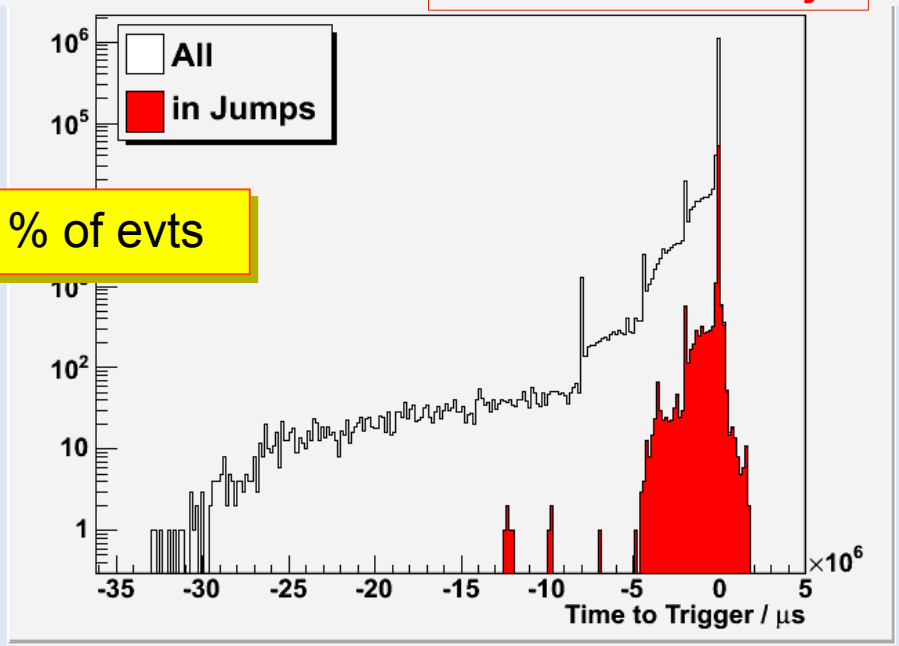
-30 s

Beam structure (spills)

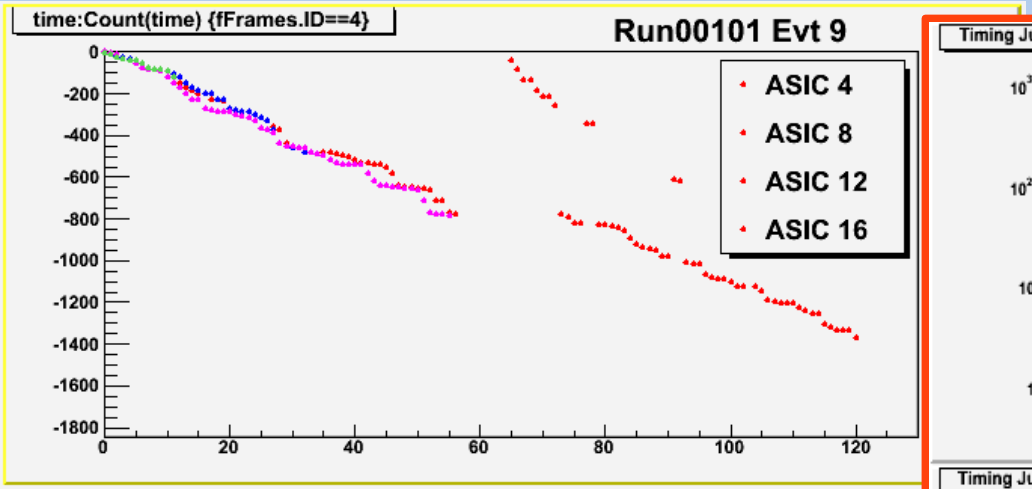


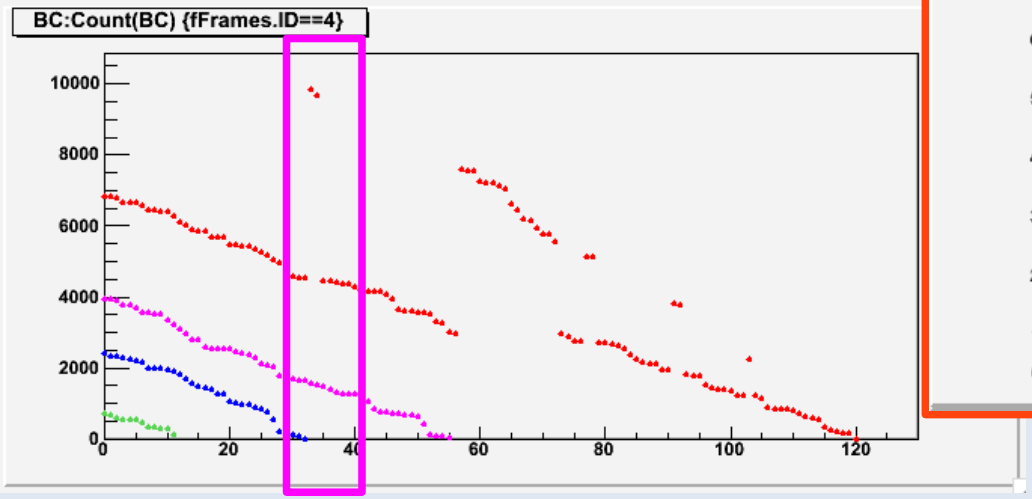
Timing jumps

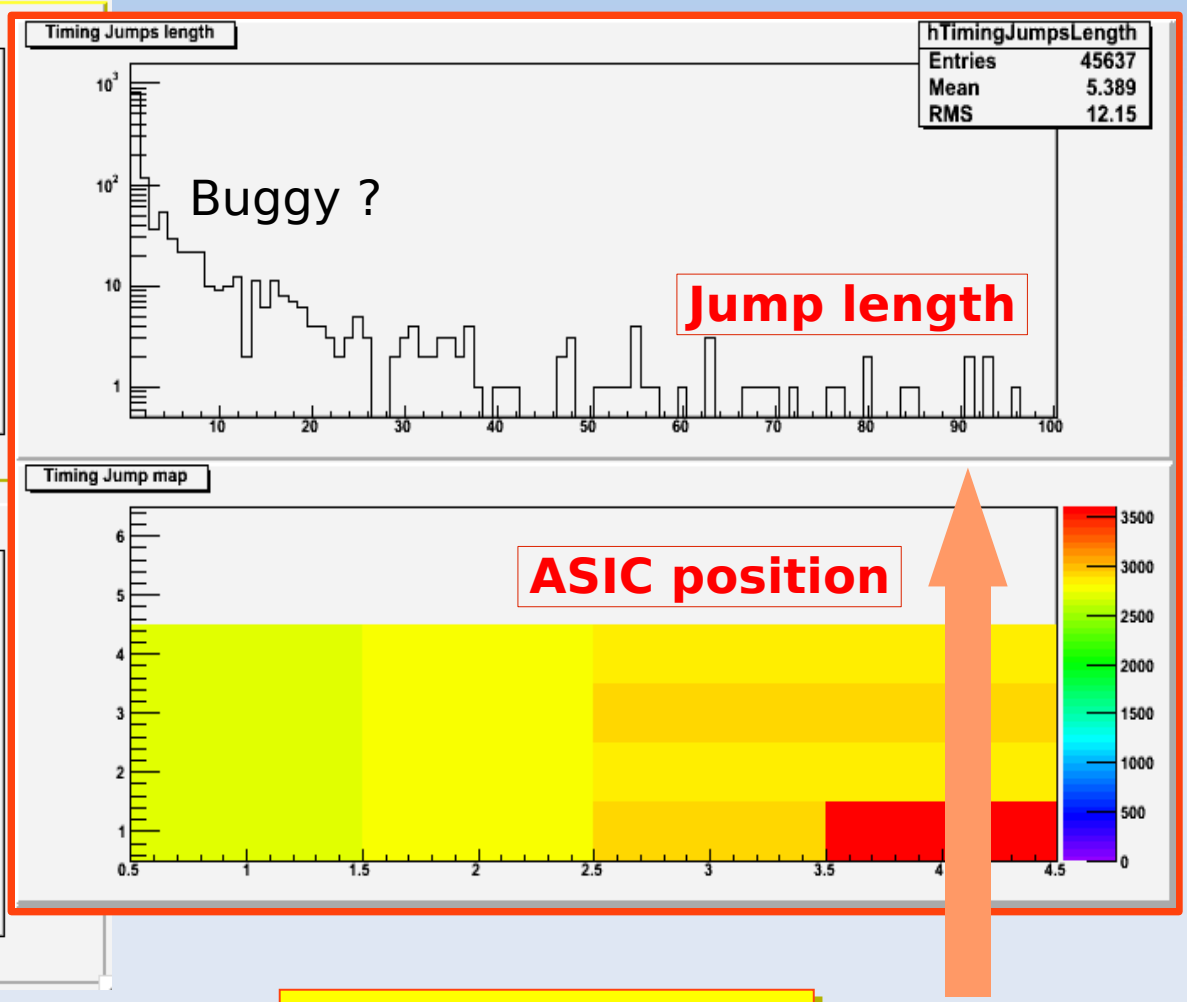




Characteristics



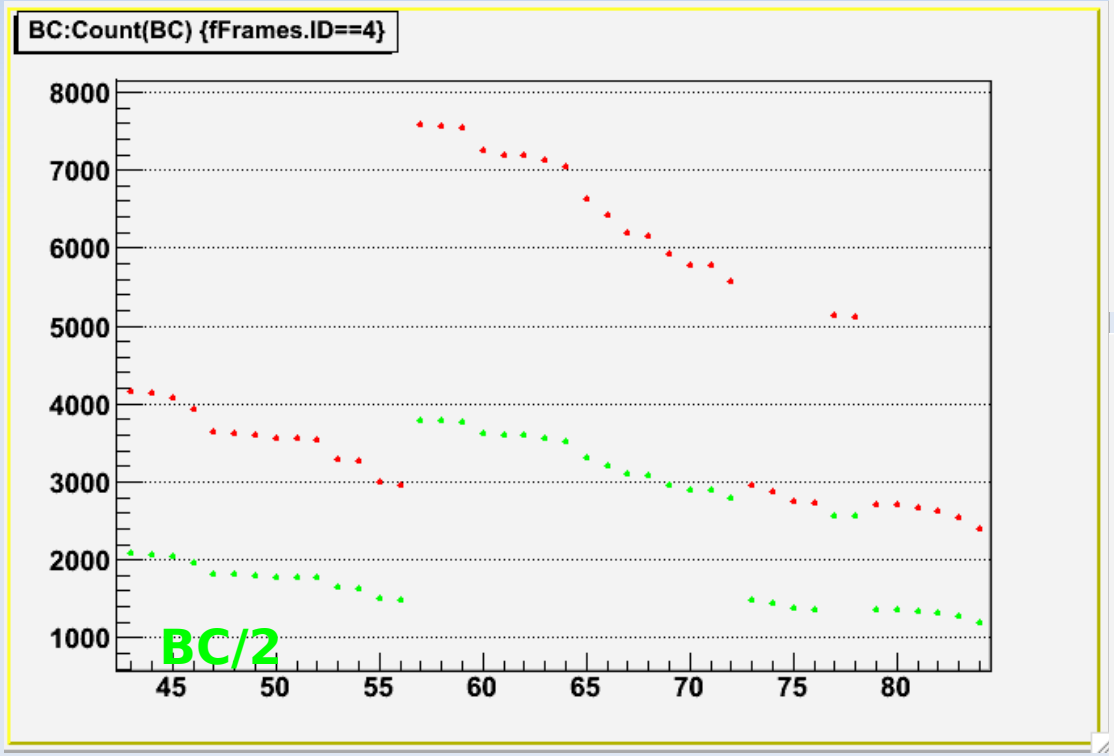


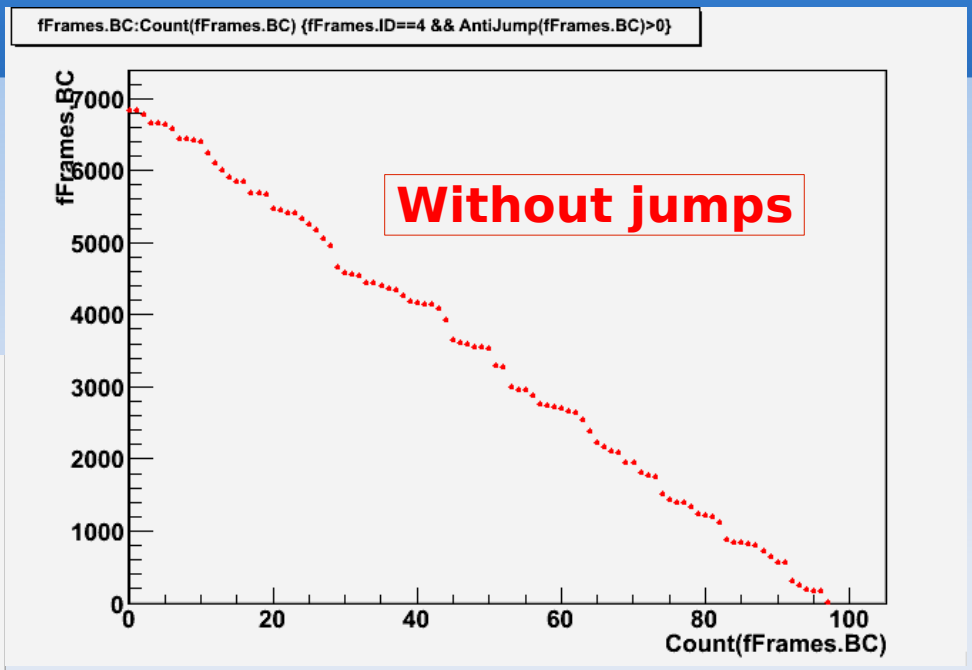


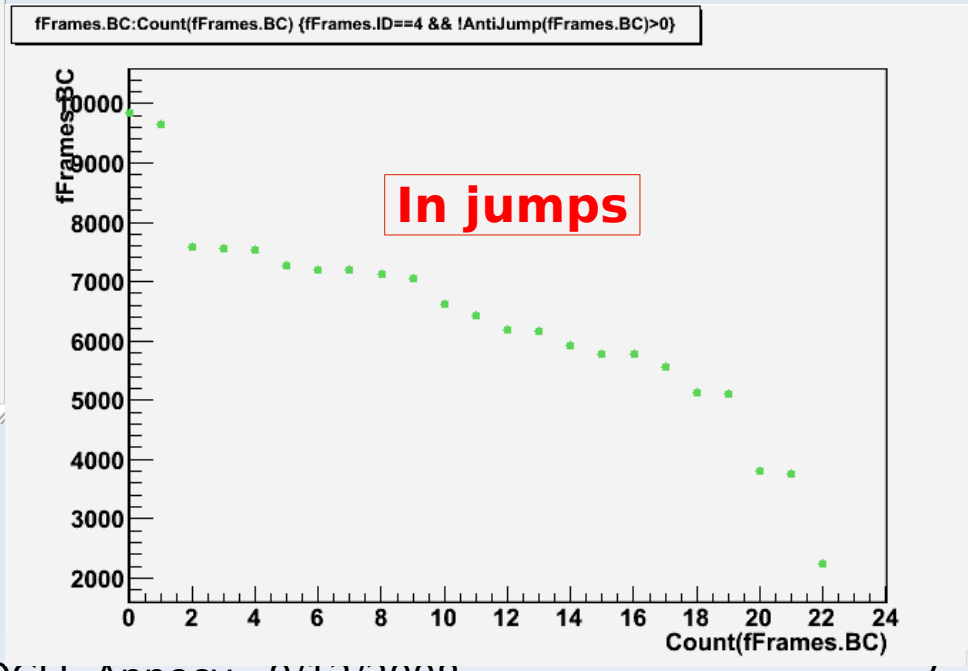
Uncorrelated to others ASICs

All asics,
all lengths (?)

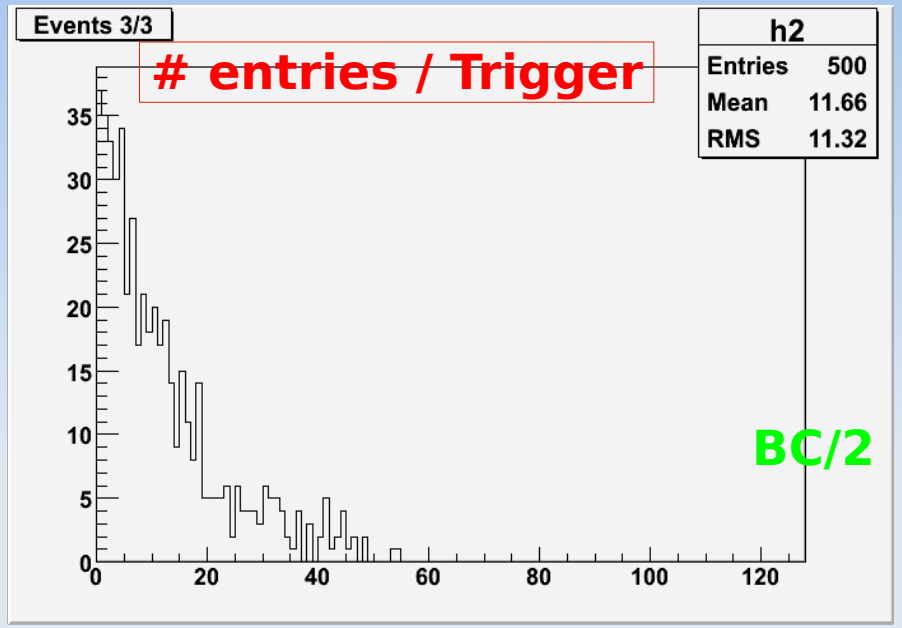
Parasitic data ?

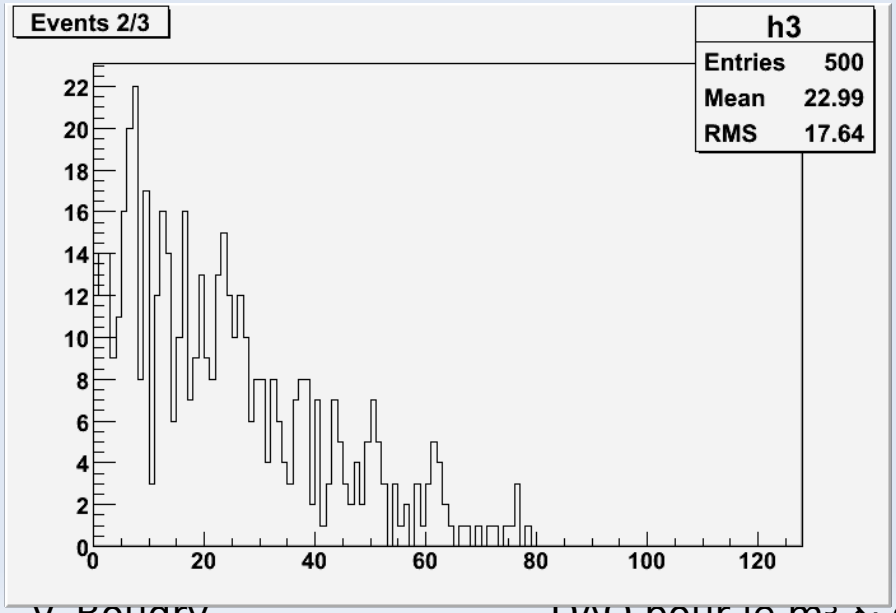






First efficiency with memorized evts





Very preliminary

Quelques premiers résultats: RUN101 ; HV=7.4 kV	
Efficacité à 3/3 coïncidences (all events)	83.66 %
Efficacité à 2/3 coïncidences (all events)	77.70 %
Efficacité à 3/3 coïncidences (t>-300 ns)	88.07 %
Efficacité à 2/3 coïncidences (t>-300 ns)	79.60 %

Summary

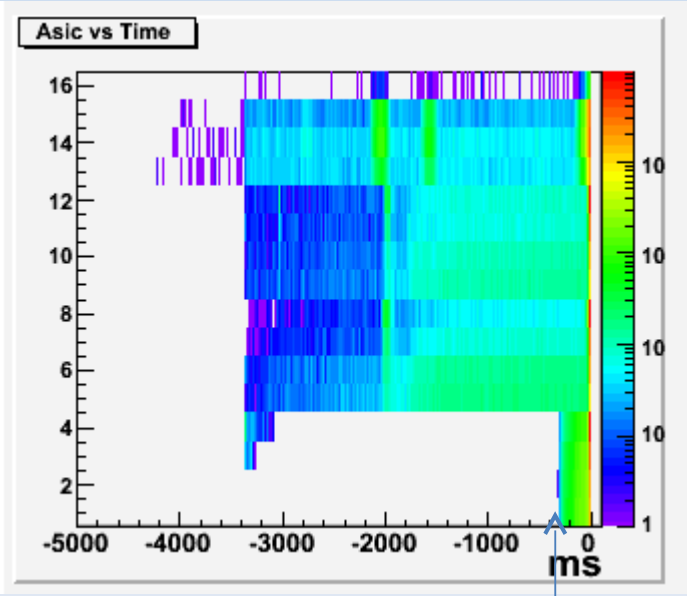
- Timing can be reconstructed ↘ -30s to the trigger
- ~1% of frames are in “timing jumps”
  - Characteristics
    - ~evenly distributed in all asics
    - Not correlated between ASICs
    - Timing distributions looks OK if jumps are removed
    - Data “in jumps” look reasonable too
  - Possible origins:
    - Readout pbm ⇒ will be checked with µMeGas 4HR + DIF data
    - HR write pointer jumps
      - Sim. data reviewed by F. Dulucq: OK ↗ 70 & 10 MHz (jitter btw clks ?)
      - Possible: X-checks:
        - look for existing data in jumps
        - Special calib data runs
- Start of use of the full statistics of HR

Efficacité avec evts memorisés

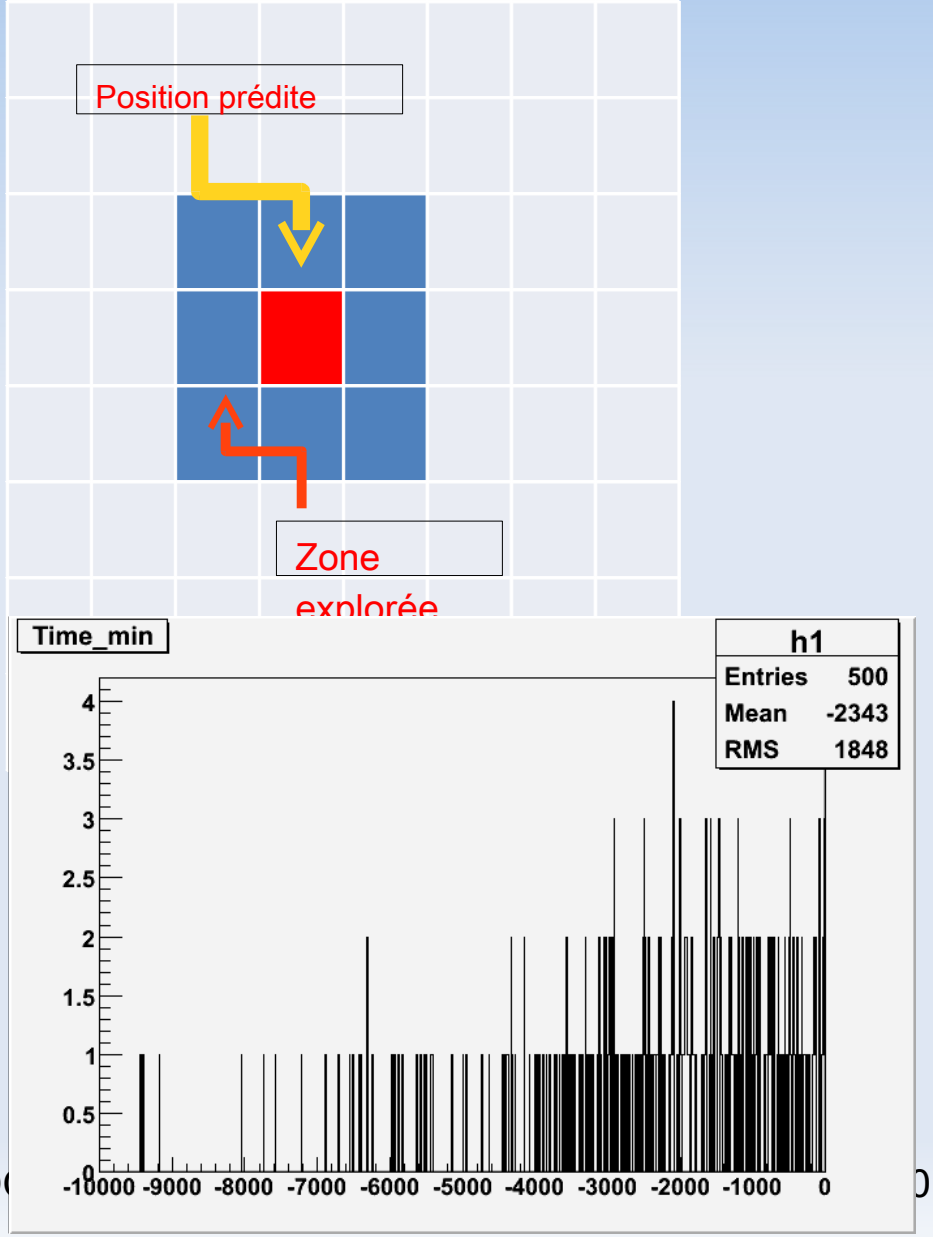
1ère reconstruction d'évt en train de « type ILC »

Sélection en position: ±1 pad en X et Y.

Sélection en temps:
- δt< 5%
- disponibilité des cartes.



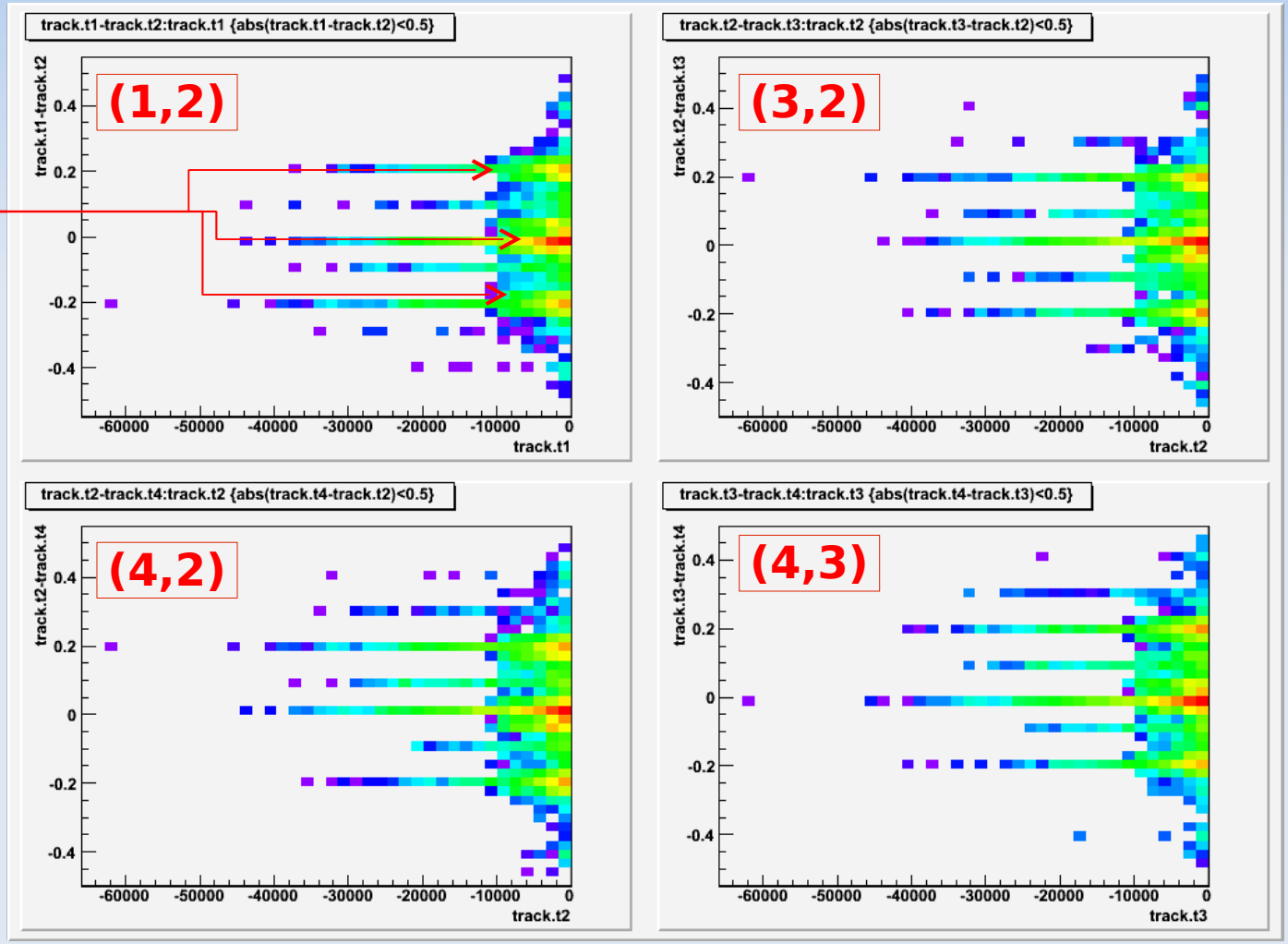
Temps de référence pour la dernière carte



Calibration en temps

Corrélation en temps entre les différents ASICs

Pics à ±200ns (et ±100ns)



Intercalibration inter-carte:

$\delta f/f \leq 0.5$ ppm

Δt (ASICs)

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Time → trigger/ µs