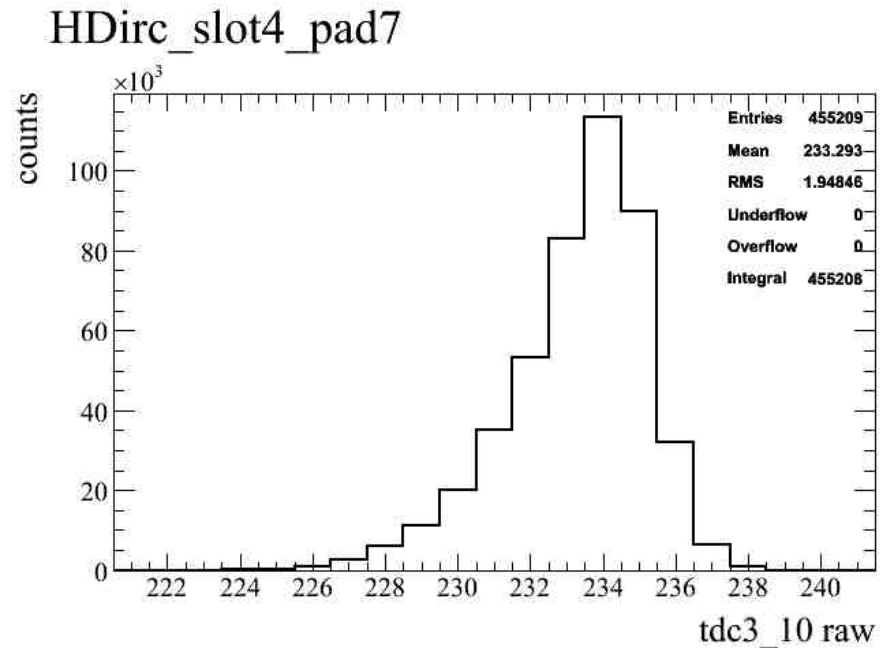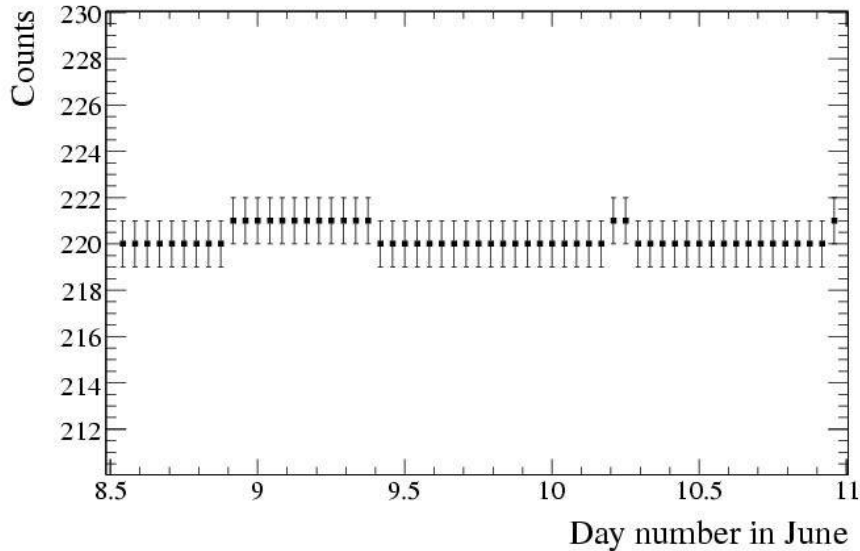# Origin of offset variation

Principle of the marker

- In order to know if the offset fluctuation are due to the electronic, Jerry have put a marker derived from TDC start.

- The histogram of TDC distribution of the marker TDC is one peak.

- So, I have studied the marker position evolution on 3 day and compare it to the offset evolution during these 3 days.

- A second run of 3 days was done including the CFD in the loop.

HDirc_slot4_pad7

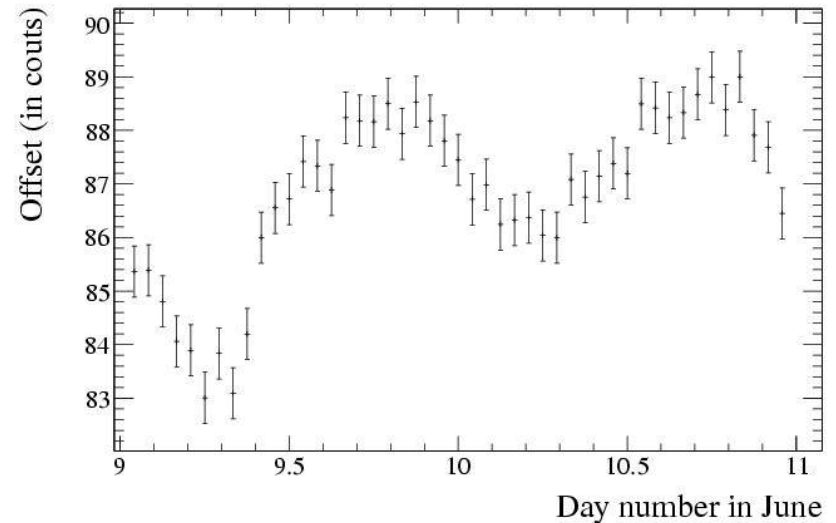| Entries | 455209 |
Mean	233.293
RMS	1.94846
Underflow	0
Overflow	0
Integral	455208

tdc3_10 raw

Evolution of the marker position

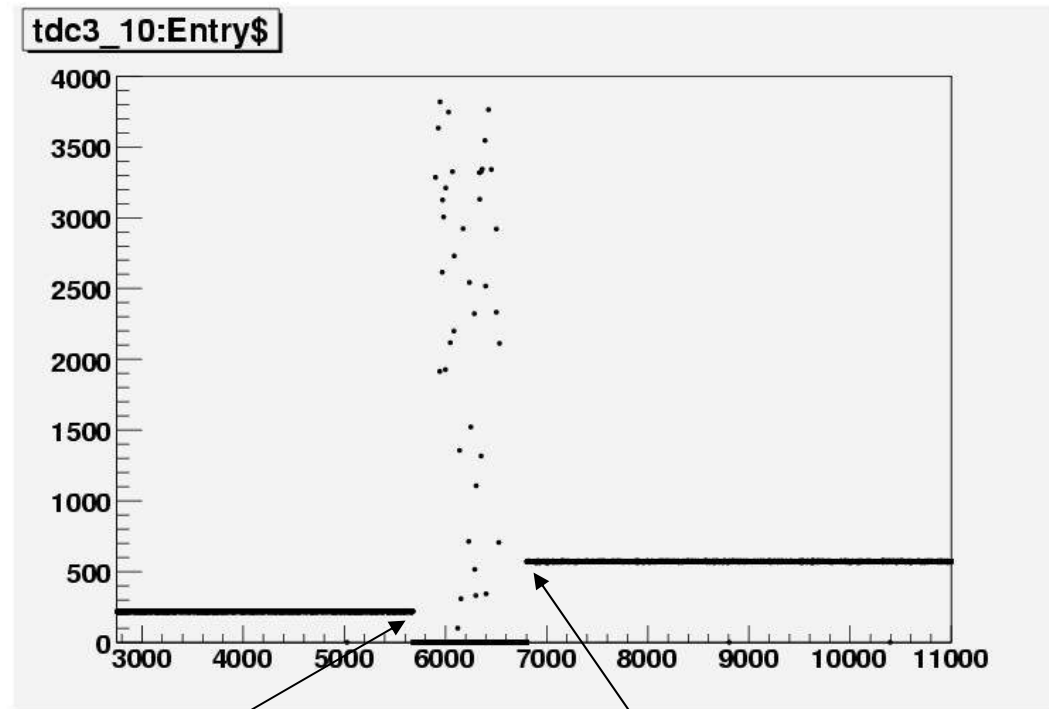Evolution of position of maximum of marker's peak

Evolution of offset on slot 2 pad 44

The position of the maximum of the marker is very steady (alternate 220 and 221). In the same time, the offset have 6 counts variation. So, the variations of offset are not due to the TDC.

Connection of the CFD

- In order to know if the offset variation are due to the CFD. Jerry have connected the CFD in the loop.
- The graph on the right represent the TDC value in function of event number during the connection of the CFD. We can see a shift of the peak after the connection of the CFD.
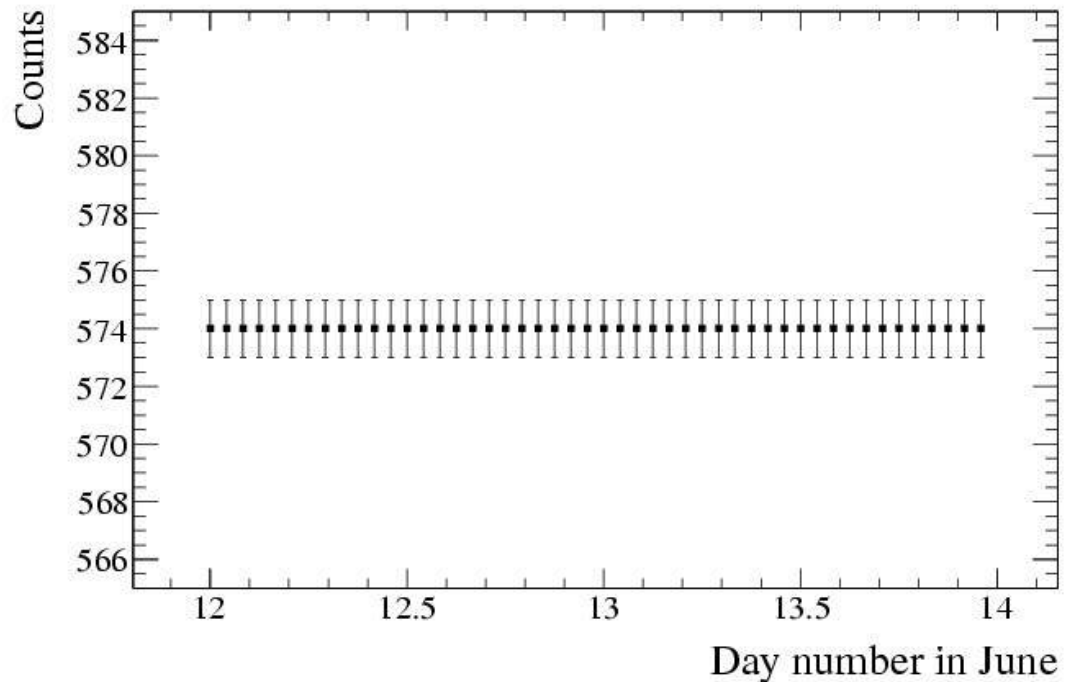

tdc3_10:Entry$

Disconnection of the loop without CFD

Connection of the loop with CFD
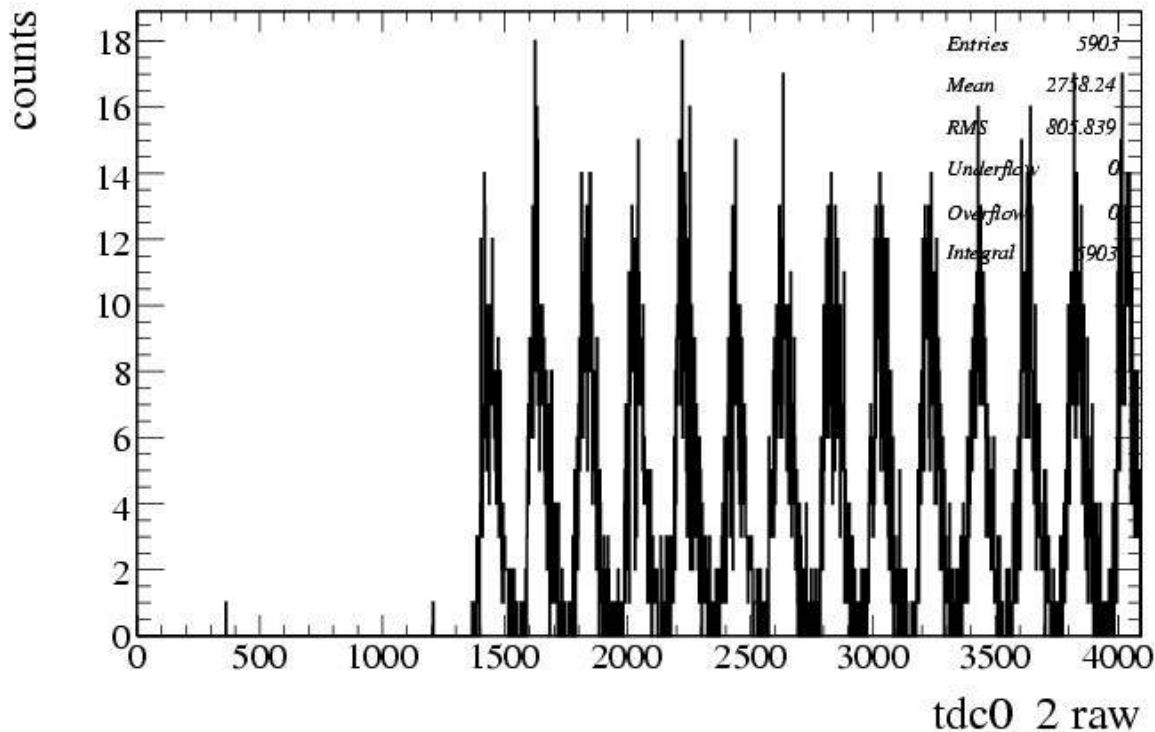
Marker position evolution with CFD

- The marker position stay very steady with the CFD.
- So, the offset variation are not due to the electronic.

Evolution of position of maximum of marker's peak
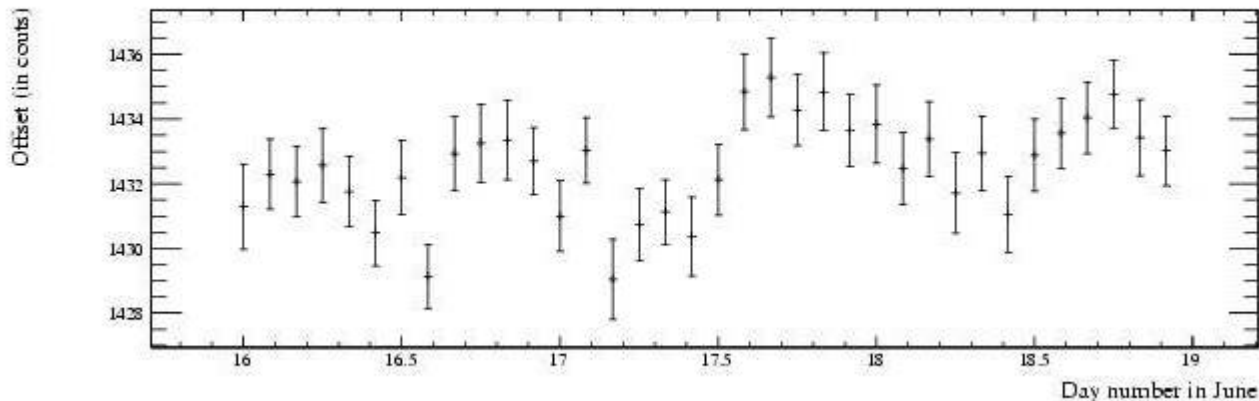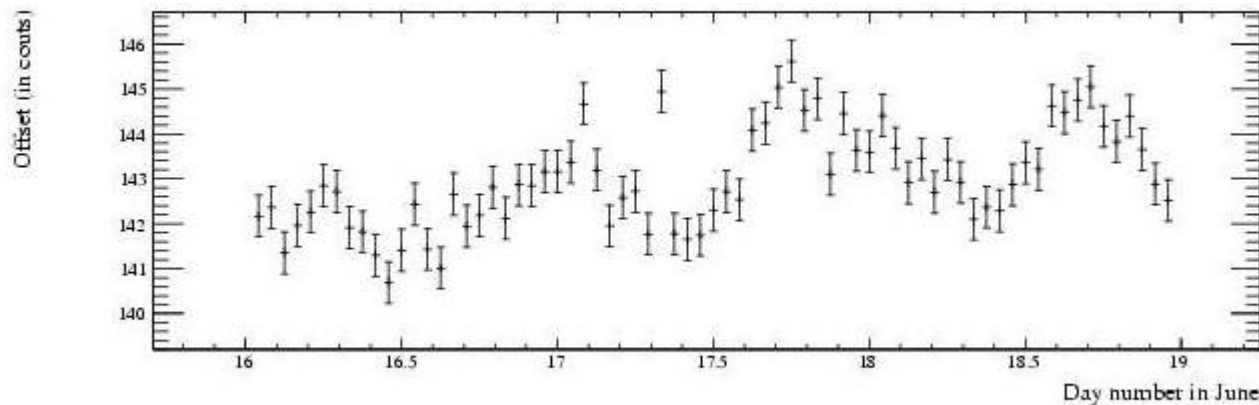
Stability of the start counter

HDirc_start2

- For studying the stability of the PILAS laser, Jerry have connected the optic fiber directly on a PM.
- The signal is very low. So, I have grouped the TDC values by 2. With this binning, we can see 13 of 20 peaks of PILAS.

Start Counter evolution (06/16 to 06/18)

Evolution of offset for start counter

Evolution of offset on slot 3 pad 56

The offset evolutions for the pads and the start counter seems to be the same. It tends to indicate that the offset fluctuation are due to the laser or to the pulser and not to the prototype.