Background estimation for pixel cluster counting in Van der Meer scan

Aurélien CARLE, Nicolas CHANON

Institut de Physique Nucléaire de Lyon

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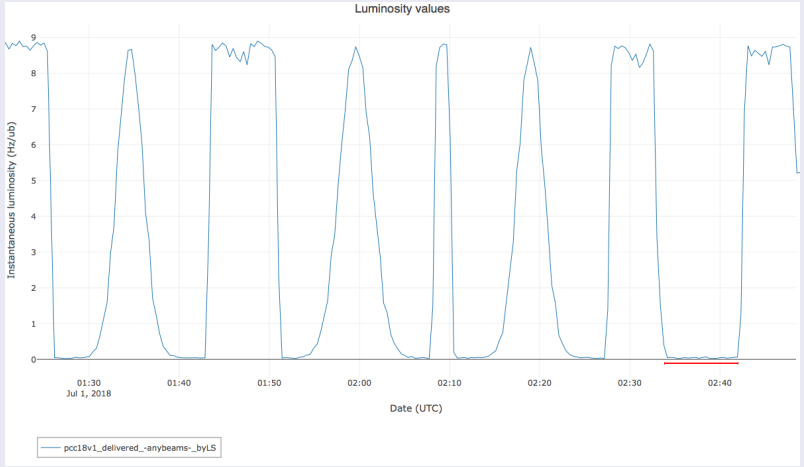
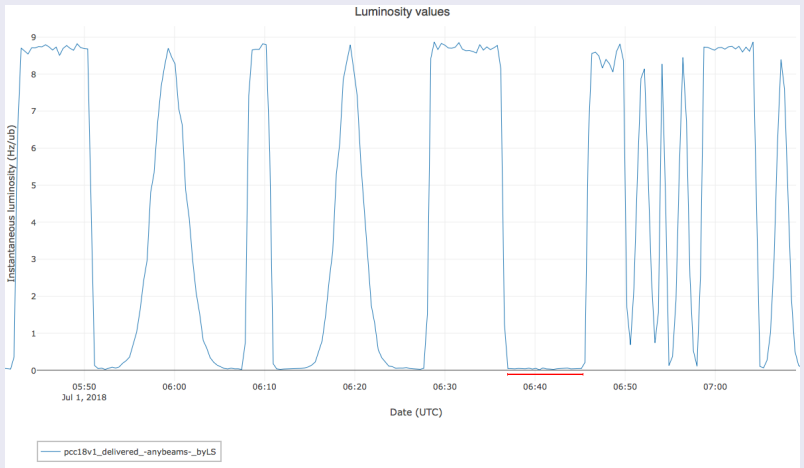
Noise estimation with long separation scan

- Super-sep. scan 1, Jul 1 2 :35-2 :40 UTC. Timestamps : [1530412500, 1530412800]

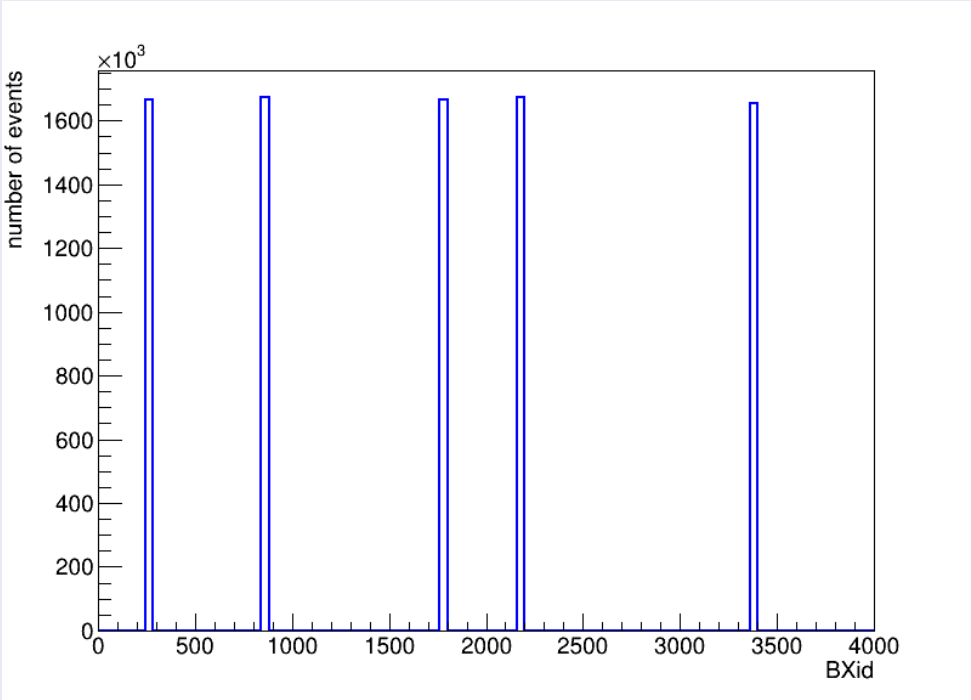


- Super-sep. scan 2, Jul 1 6 :38-6 :44 UTC. Timestamps : [1530427080, 1530427440]



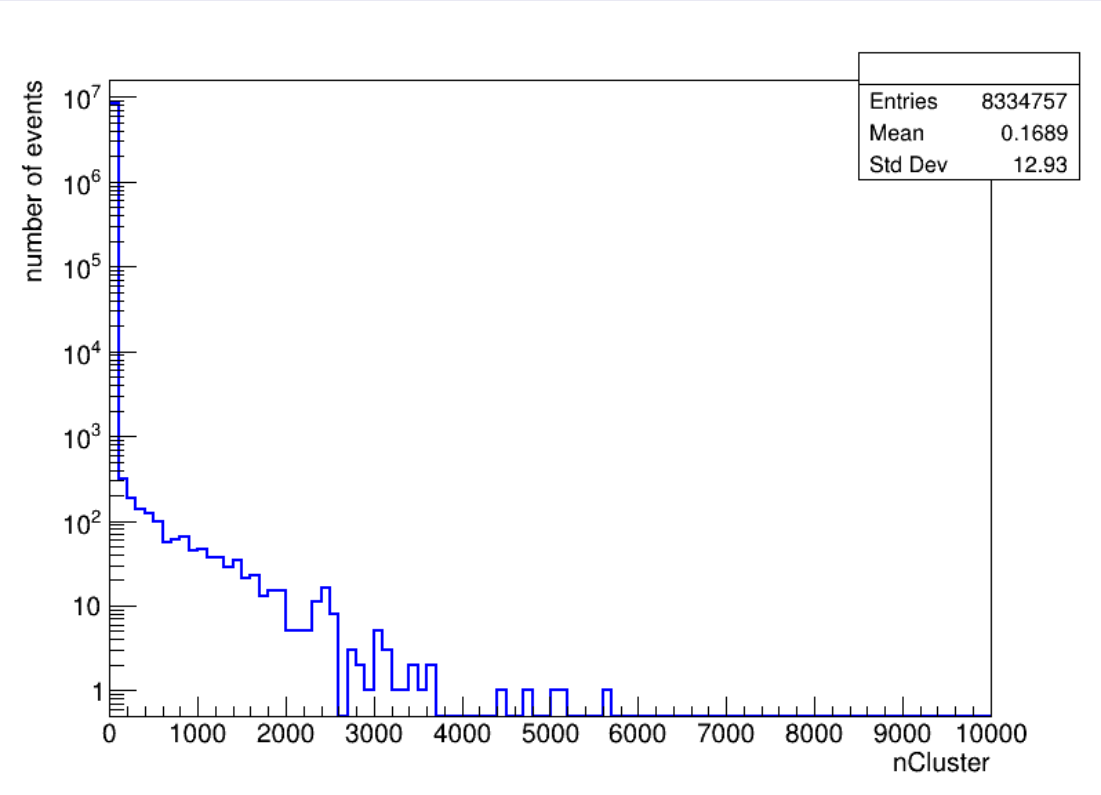
PCC triggers in five bunch crossing (BX)

- 265, 865, 1780, 2192, 3380



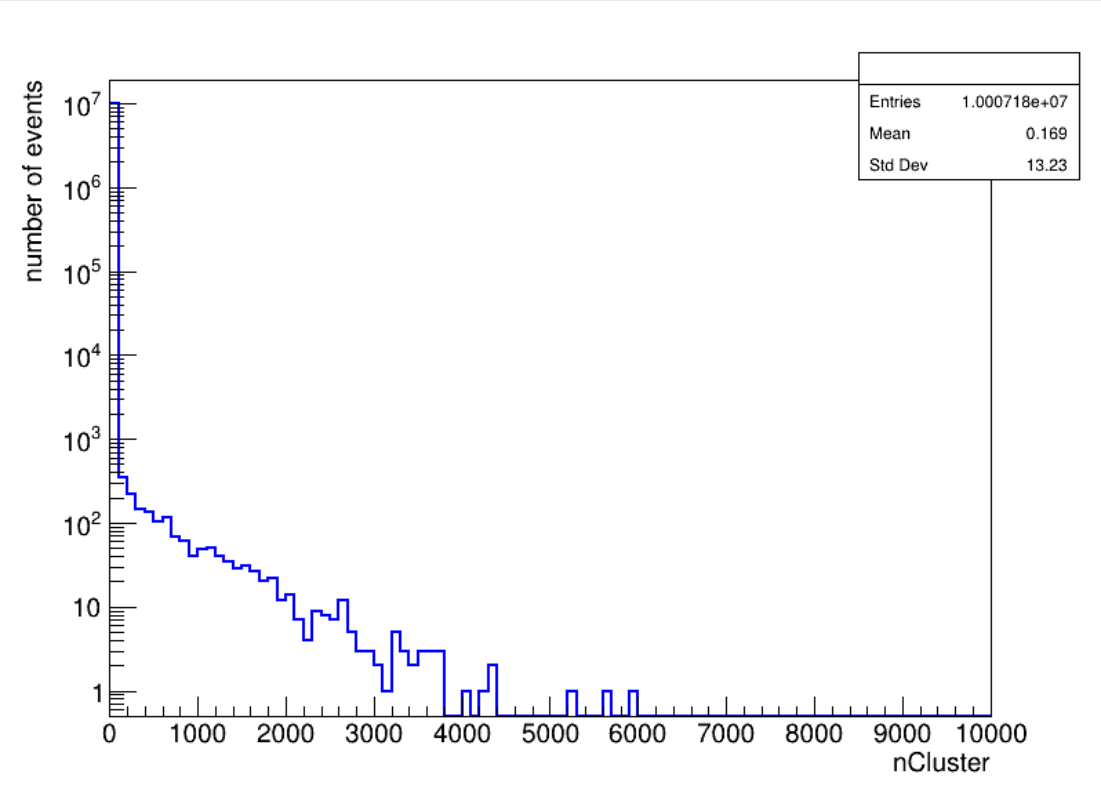
- Remove bad module list

⟨nCluster⟩ for time stamp range 1



$\langle \text{nCluster} \rangle = 0.169 \pm 0.005$ stat. uncertainties only

⟨nCluster⟩ for time stamp range 2



$\langle \text{nCluster} \rangle = 0.169 \pm 0.004$ stat. uncertainties only

⟨nCluster⟩ per BX

Time stamp range 1 : 1530412500 $<$ timeStamp $<$ 1530412800

BXid	⟨nCluster⟩
265	0.18 ± 0.01
865	0.153 ± 0.009
1780	0.19 ± 0.01
2192	0.16 ± 0.01
3380	0.17 ± 0.01

For all in time stamp range 1 :

$$\langle \text{nCluster} \rangle = 0.169 \pm 0.005$$

⟨nCluster⟩ per BX

Time stamp range 2 : 1530427080 $<$ timeStamp $<$ 1530427440

BXid	⟨nCluster⟩
265	0.170 ± 0.009
865	0.176 ± 0.009
1780	0.19 ± 0.01
2192	0.134 ± 0.007
3380	0.18 ± 0.01

For all in time stamp range 2 :

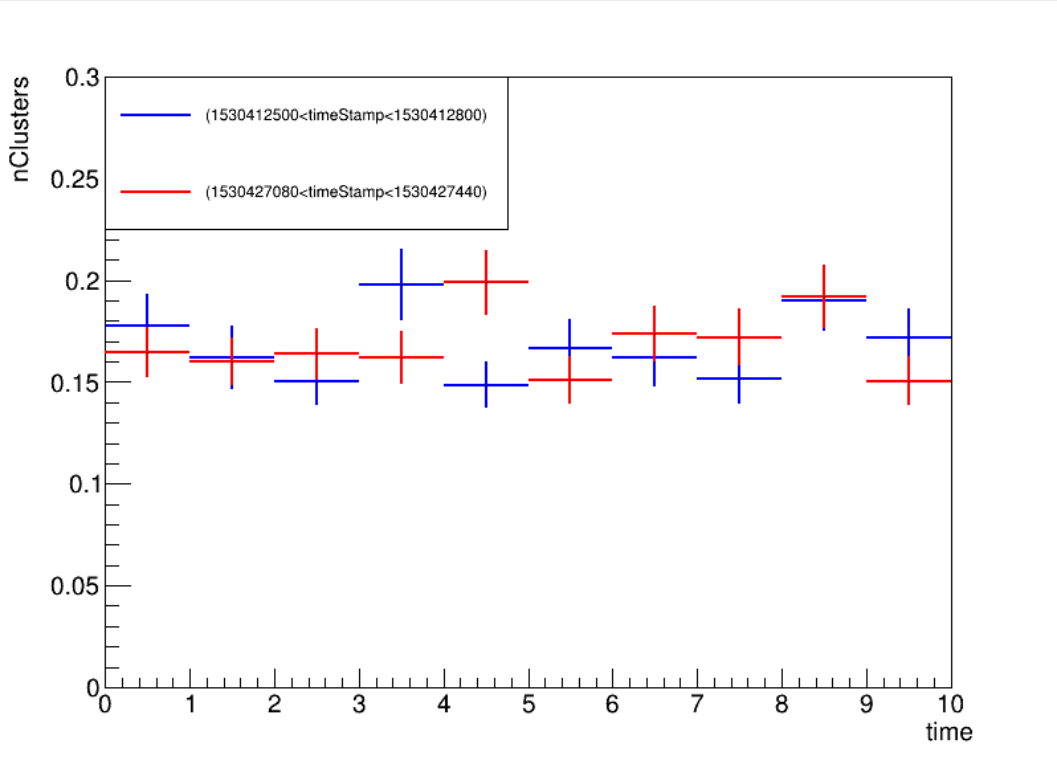
$$\langle \text{nCluster} \rangle = 0.169 \pm 0.004$$

For all in the two time stamp ranges

$$\langle \text{nCluster} \rangle = 0.169 \pm 0.003$$

Variation within the scan (to illustrate)

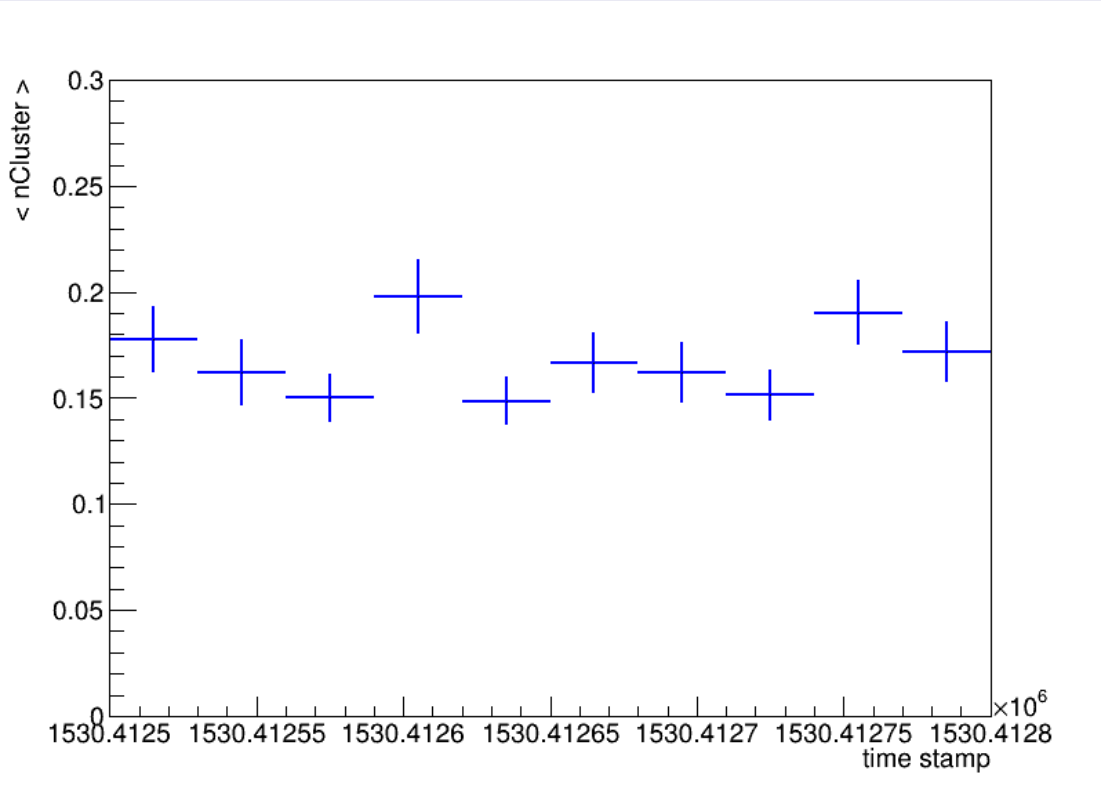
All the time stamp ranges in same plot :



(In this plot, bins do not represent the same duration for timestamp ranges 1 and 2)

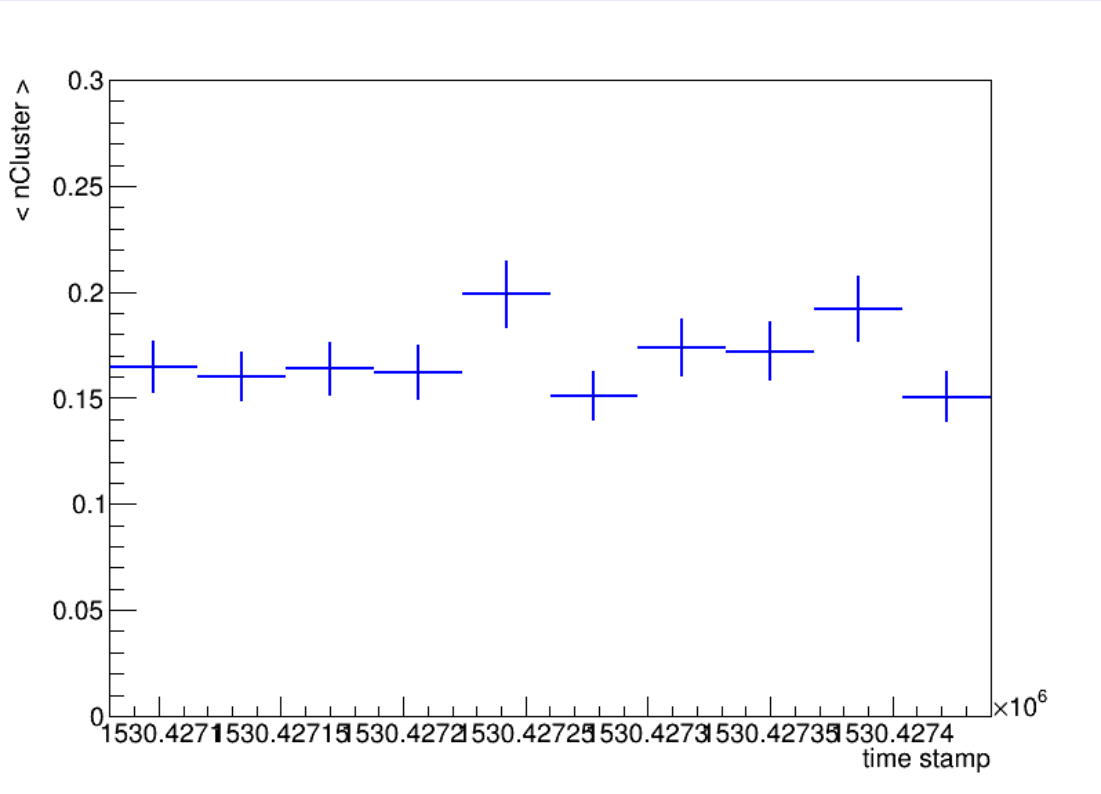
Variation within the scan

Time stamp range 1 :



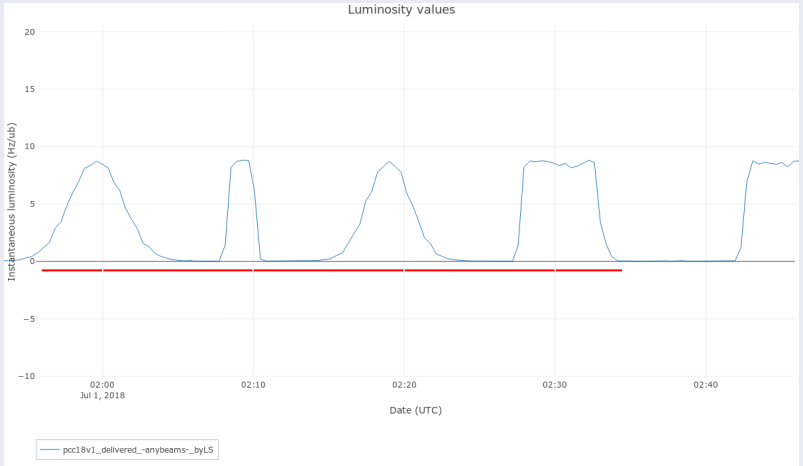
Variation within the scan

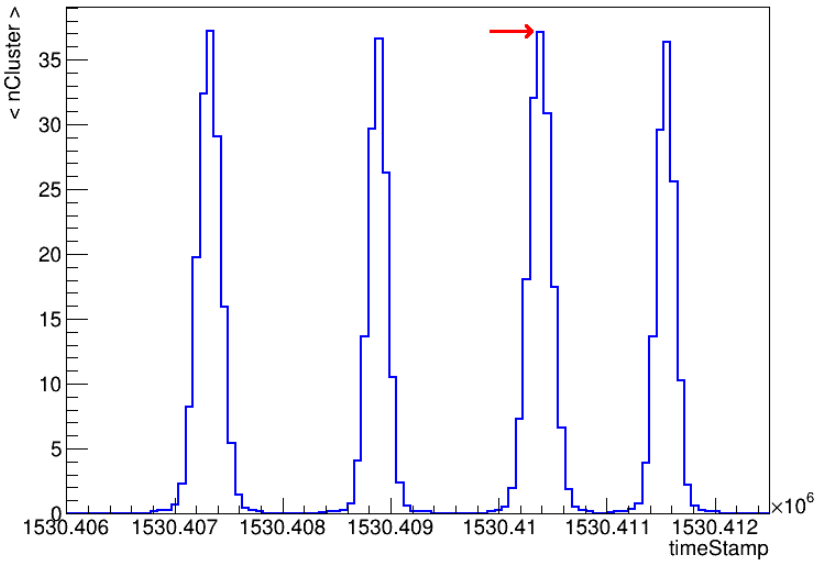
Time stamp range 2 :



Ratio Background / Head-On value

- Compare background value with head-on value of $\langle$nCluster$\rangle$





- Ratio is : 0.45%