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LIGHT SUM SQUARED

JUMP COLUMN INVESTIGATION

▸ Wanted to look into jump columns run by run and event by event:

▸ How?

  ▸ Run by run: I did a quick by eye study outputting the projection subtractions for a range of runs

  ▸ Event by event: We get event N and N+1 and take there y projections and subtract (N_y - $N+1_y$) and take a look at the resultant histogram

▸ Classifications:

  ▸ Jump column: Column with ADU over 5000 or under -5000

  ▸ Transient: Largest Column in (N_y - $N+1_y$) is smallest column in ($N+1_y$ - $N+2_y$)

  ▸ Hot pixels (Transient) : A transient hot pixel can cause transient false positives (These are checked for (500ADU threshold))
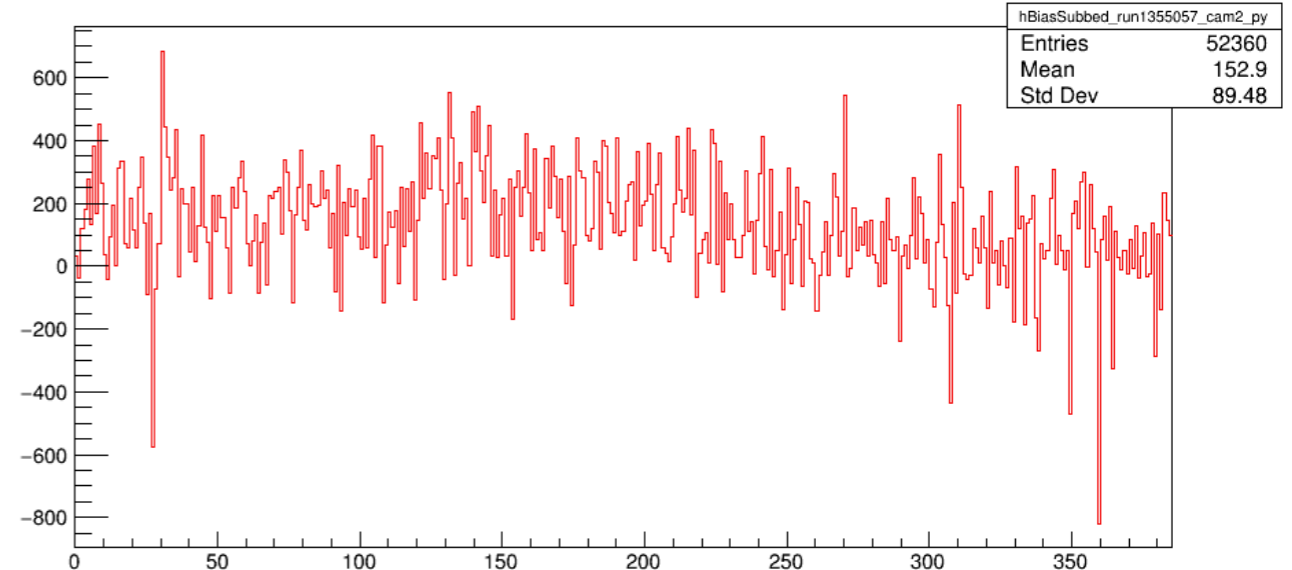
JUMP COLUMN INVESTIGATION CONSECUTIVE RUNS

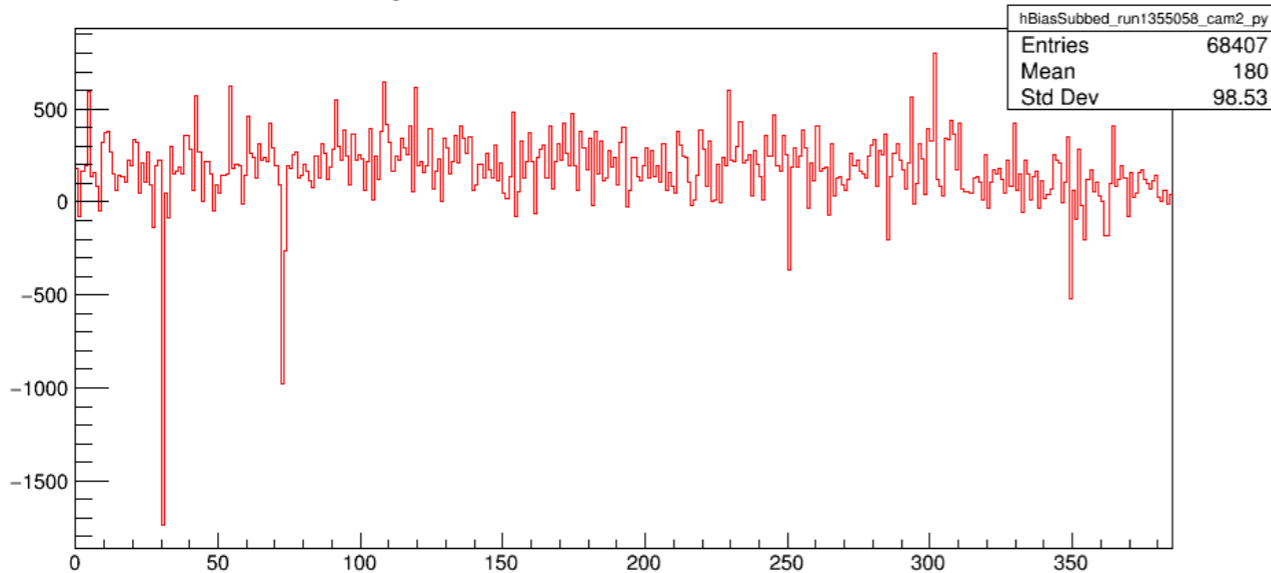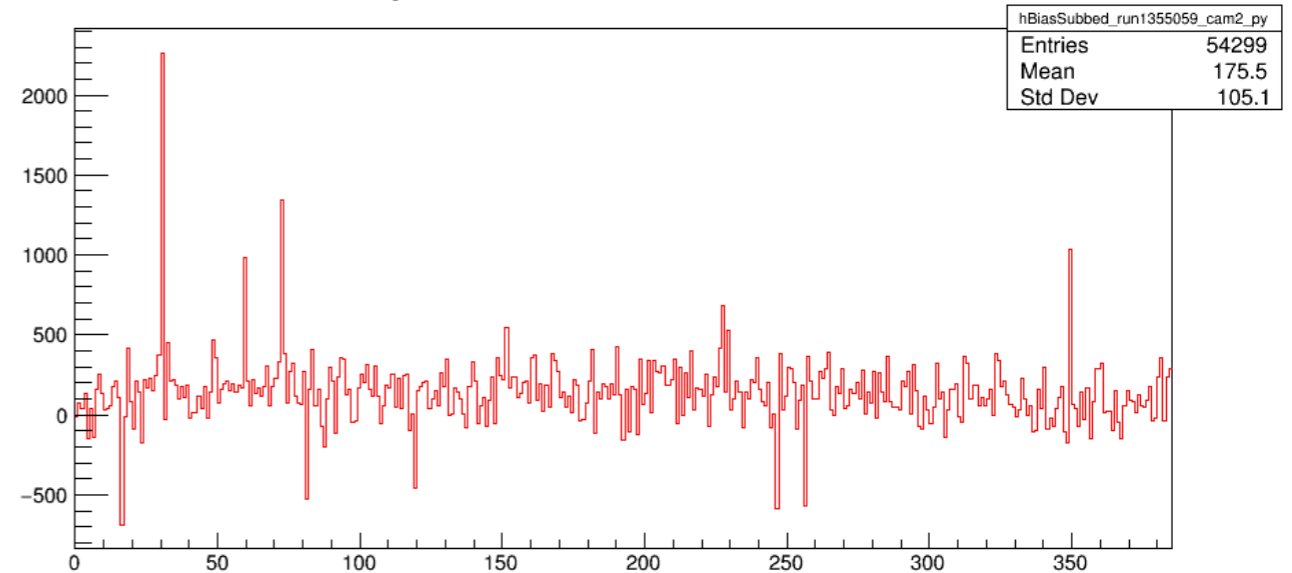▸ Just as a quick by eye study for consecutive runs I estimate between 2 and 8 column jumps per 100 events
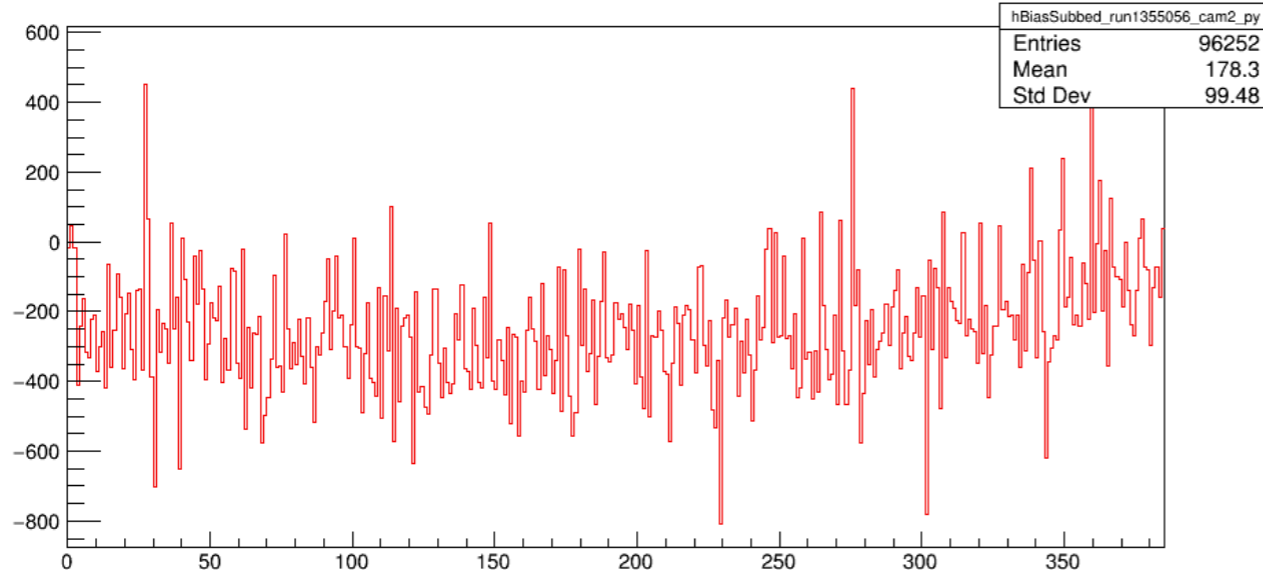
TRANSIENT & HOT PIXEL

▸ Here we can see a transient column jump

▸ iff this column does not contain a pixel > 500 ADU it will be classified as a transient

▸ NOTE: 500 ADU / 385 Pixels = 1.3 ADU per pixel

▸ If said lowest column was not highest in next plot this would be a jump and not a transient or hot pixel

ProjectionY_Eve10_sub_Eve11

hBiasSub_run1355057_cam2_eve10_py	
Entries	59356
Mean	171
Std Dev	117.1

ProjectionY_Eve11_sub_Eve12

hBiasSub_run1355057_cam2_eve11_py	
Entries	94590
Mean	191.4
Std Dev	113
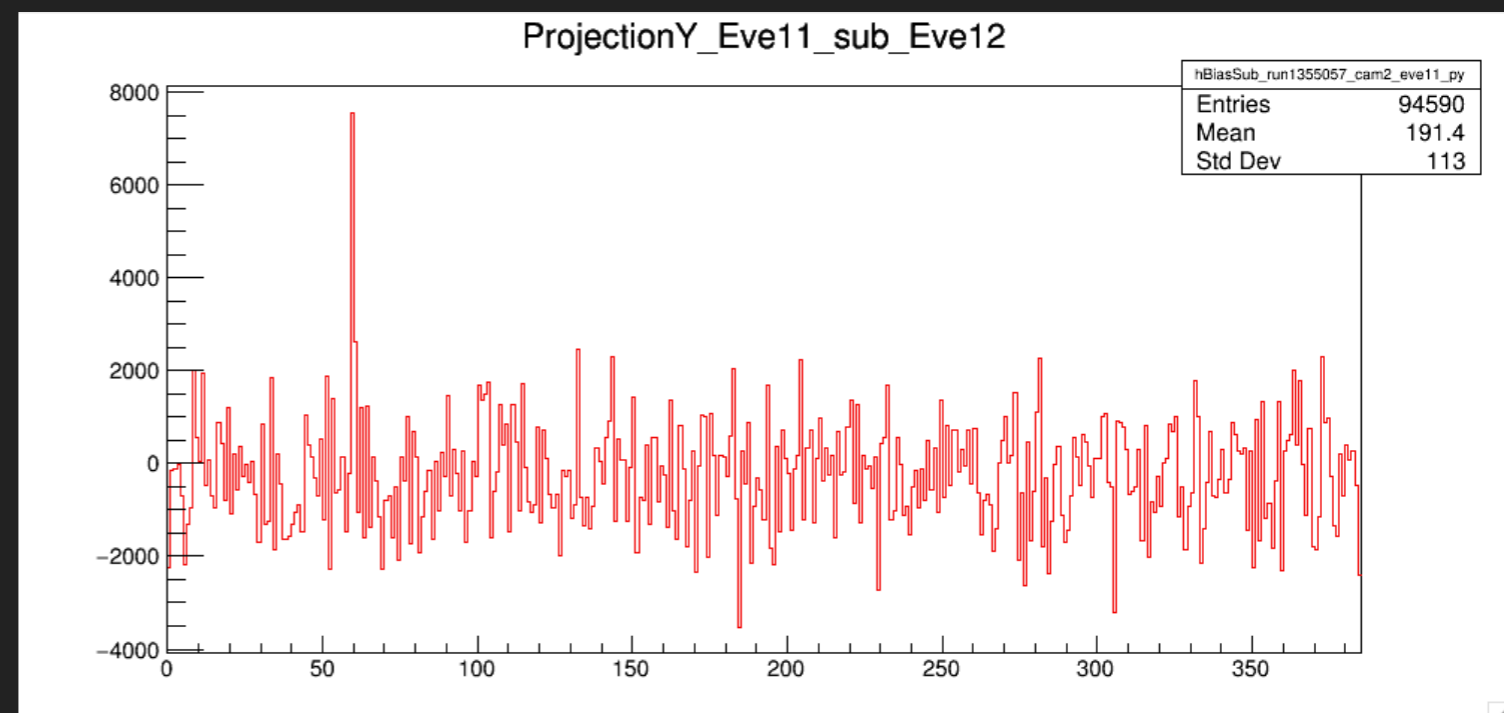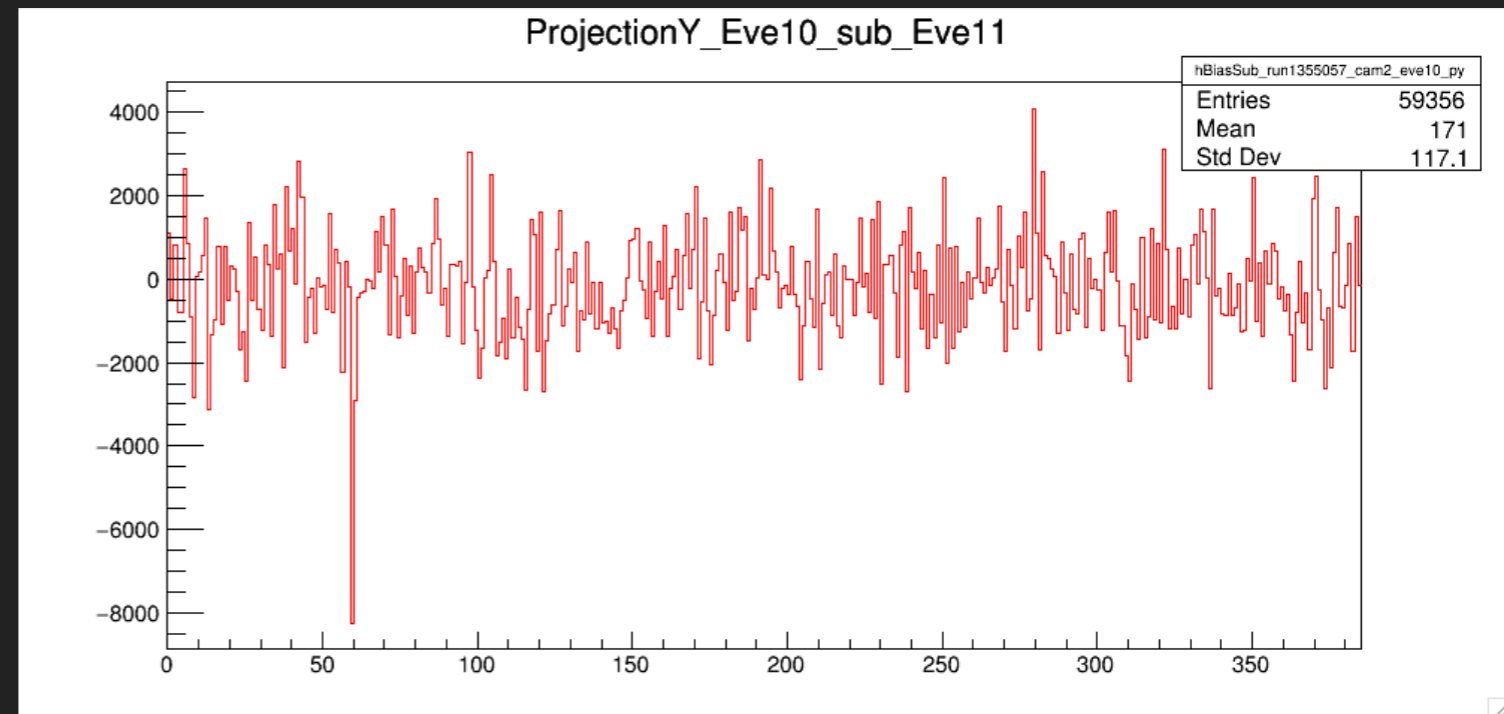
JUMP COLUMN INVESTIGATION – OUTPUT

run number	jump columns	transient jumps	hot pixels
1355055	1	10	9
1355056	1	12	7
1355057	0	10	12
1355058	0	9	10
1355059	0	14	6
1355060	0	19	10
1355061	0	11	18
1355062	1	9	11
1355063	2	15	9
1355064	1	10	11
1355065	0	4	14
1355066	1	10	9
1355067	0	10	11
1355068	1	6	8
1355069	0	8	12
1355070	1	6	14
1355071	2	7	11
1355072	0	11	12
1355073	0	8	15
1355074	0	8	8
1355075	0	14	12
1355076	0	10	11
1355077	0	11	13

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run number	jump columns	transient jumps	hot pixels
1355055 – 1355077	0.483516%	10.1978%	11.1209%
1254029 – 1354037	0.561167%	10.101%	12.2334%
1340023 – 1340047	0.686869%	9.73737%	11.4343%

▸ Here we have the results for some set of similar runs for per superbis frame

▸ Things to note:

  ▸ Jump columns (& transient jumps) is likely an large under estimation looking at y subtraction of consecutive runs as we often can't see small column jumps per event

CONCLUSIONS

▸ I could spend much more time on this project to get exact number on these artefacts, however we know they exist and we are able to account for them

▸ By adding in a per y column average subtraction (omitting source box pixels) we can both correct for transient and non-transient jump columns

▸ The option for fitting or averaging columns with a ADU cut will be chosen here to remove effect from hot pixels