

Javi's First conclusions of the TB Depfet analysis.

In order to reduce the number of entries of pixels in the first two detectors (D0 and D1) as suggested us the Prague group in the last EVP TB meeting we are tuning different parameters to increase the # of removed pixel but without missing too much signal and continue having results with sense.

- 1- Better to use **RawWise** Algorithm than Full Frame Algo than a Common Mode algo, because the pedestal values are correct only in the first:
 - a. RW ~14 (as we expected)
 - b. FF ~25

Anyway, the best option is use the RawWiseMediam, as was suggested by the prague group, but we are waiting for the code developed by Christian

- 2- Better to choose as **Perform Common Mode** the value 1 (corresponding to Full Frame). This is contradictory with the 1 point but if we choose the value 2 (corresponding to RawWise) we obtain in the detector 5 (d5) signal values in the SeedCluster histo bellow 500 ADU (when we select the Seed35 sigma cut it supposed that can not appear signal bellow $16 \times 35 = 560$ ADU)

- 3- Better to **cut on the SeedSignal** with Seed7 sigmas and also a cut bellow 500 ADU, instead of only a cut on SeedSignal with Seed35, because as well as the previous problems with the Seed signal in D5, we obtain a number of entries (# of pixels) larger in D1 than in D0, and it has not sense.

	Number of entries	
	Seed35	Seed7 & cut 500ADU
D0	15144	18874
D1	16139	18289
D2	10978	13305
D3	15269	17970
D4	15670	17738
D5	13900	18144

As you can see it has sense that when we choose a wider cut we obtain a larger number of entries.

- 4- For the value of **MaximumClusterperPlane**, it is enough to choose 5, but we are going to use 100 (as Julia does).

NOTE: Christian choose a more restrictive value

MaximumClusterperPlane=1

MinimumClusterperPlane=1

But if we do that a lot of entries are missing, as well as the number of entries are the same for all detector (# entries = 7276) and we need to understand better this step, first to apply it.

Last Results from the Javi's Analysis

The values chosen for this analysis are:

- 1- Algorithm = RawWise
- 2- Perform Common Mode =1
- 3- SeedSigma cut = Seed7 sigma and cut bellow 500 ADU
- 4- FFClusterCut = 2.6 (also use by Bonn people as is shown at page 46 in TDR of Depfet)
- 5- Algorithm Noise Distribution with different values in the cut PixelMaskUpperNoiseCut(PMUNC) =2, 3 and 4

First Observations from this analysis

- 1- The shape of the Seed Signal and Cluster signal distributions is similar for all values
- 2- The number of entries increases as the sigma is larger, as it is expected
- 3- The number of pixels don't increase more in D0 to D1, but it does in D1 and D2, as the sigma is larger
- 4- The number of entries in D1 is not longer larger than in D0.
- 5- But we have more entries in D5 than in D4 → Prague people say that there is a noisy detector that works worse than the other, may be D5 is that, and we select noise as signal.

	Number of Entries		
	PMUNC =2	PMUNC =3	PMUNC=4
D0	18882	18927	18932
D1	18292	18463	18503
D2	13311	13722	13831
D3	17971	18221	18278
D4	17739	18019	18105
D5	18152	18220	18233

Number of pixels removed

From MARLIN → only BAD pixels

From ROOT → BAD + HOT + DEAD pixels

- BAD pixels = pixels removed by PixelMaskUpperNoiseCut
- HOT pixels = noisy pixels, they enter with continuously.
- DEAD pixels = doesn't work or doesn't exceed a particular pedestal value

	Number of Pixels Removed					
	PMUNC =2		PMUNC =3		PMUCN=4	
D0	638	644	247	253	81	81
D1	652	1247	200	281	51	62
D2	648	2036	360	674	185	185
D3	605	1225	233	314	55	68
D4	399	1143	167	330	62	89
D5	139	378	131	266	129	141

In the PMUCN=4 case, the # of pixels removed in D5 is larger than in D4, may it can be due to be the noisy detector as Prague people said.

ACTUAL PROBLEMS in the Analysis

- 1- We are not sure that ETA Correction is properly applied
- 2- We are applying Eta correction run on 1 pixel → the Depfet group in the last EVO TB meeting told us that we must apply the Eta Correction under 2 pixels → in order to do it, it will be needed to change the code, so we must ask to Christian about these changes.
- 3- We are not already using the RawWiseMediam algo, and this algo has been suggested by the Prague group as the Standard way to do the analysis
- 4- We have an error message as "NULL DATA..." in Marlin → possible error in LCConditionsMGr.cc file
- 5- All the analysis chain take a lot of time running Marlin, we are not sure if it is OK