22/03/2017
Report on the time calibration procedure.

We've been reviewing the procedure for the time calibration and we achieved several things:

- The firmware of one of the bp was different from the others, so Gustavo updated it.
- We realized that we can't set the coarse to values higher than 10 (0xa), so in the configuration of the 4 modules, the highest value that we can put in the further module is 8..
- We detected a bug in the code that prevented it to run properly for coarse value of 1.
- We can now run the procedure for all values of coarse down, up, and fine down, up.

There's one thing that we still don't understand. In principle, the number we read in the tdc should be the same (similar) in all the modules after the calibration has run for the three pairs of reference-victim. That is true for the first two pairs, but for the last one the numbers are different:

		TDC3-TDC0
Refrence	19	244205
Victim	135	243940
Refrence	135	~243940
Victim	**142**	**243252**
Reference	**142**	**187634**
Victim	78	187647

Shouldn't those two values be similar?

We did some tests with the oscilloscope to compare the values read in the TDC with the actual values.

Measures of the references:

(ps)

Reference(Pulser)	**19**	**135**	**142**	**78**
19	70,0	-680,0		
135	-100,0	70,0	-530,0	
142		90,0	70,0	320,0
78			-110,0	70,0

Differences after calibration:

Run 1:

	TDC3 - TDC0
19	244205
135	243940
142	243252 - 187634
78	187647

Difference	Procedure (ps)	Scope (ps)
19-135	265	-810
19-142	955	-410
19-78	56558	1700

Run 2 (Same delay values everywhere):

TDC3 - TDC0

19	244649
135	243798
142	243742
78	

Difference	Procedure (ps)	Scope (ps)
19-135	851	-600
19-142	907	-420
19-78		1,76

To do:

- Jakob and Mab want to review the algorithm because we think it might be corrections that are not applied properly, or at least, the output of the program doesn't show the corrected TDC read when, for example, the last number of steps that has to be applied is higher than 0.
- Understand the discrepancy in the TDC read for the third pair.
- Repeat the oscilloscope measures once when the other points are understood.