Study of different Noise scenarios in OT Digis

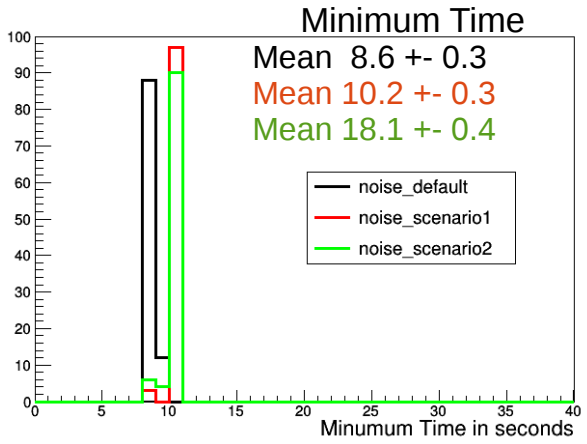
Compared different noise scenarios in the OT digis

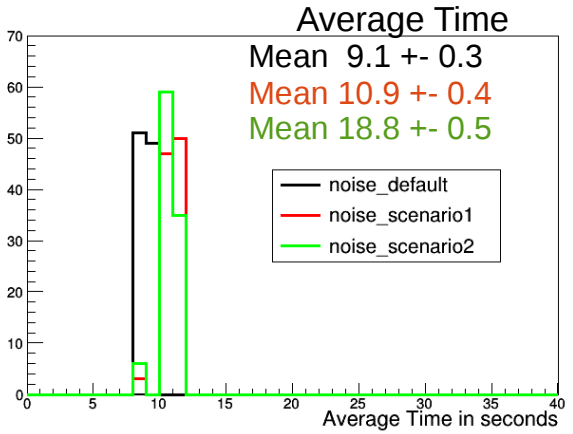
- Noise parameters we have in the in the Digitizer
  - channels with Signal
  - channels without the presence of signal
- Wanted to use more realistic noise from the input of the electronics experts
- Three scenarios considered for fired (with signal) and empty (without signal) strips

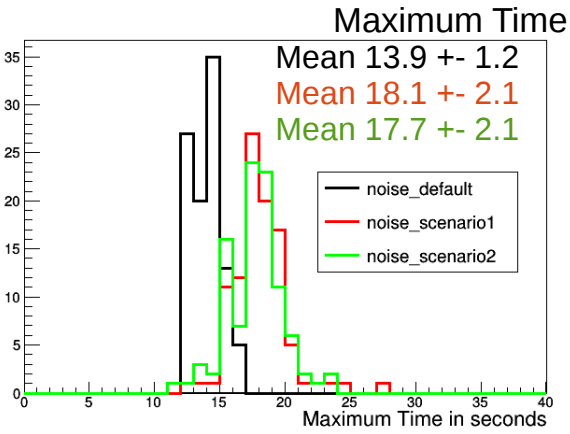
	PSP module		PSS module		2S Module	
	Signal	Empty	Signal	Empty	Signal	Empty
Default	1000e	300e	1000e	300e	1000e	300e
Scenario1	200e	200e	700e	700e	1000e	1000e
Scenario2	200e	0	700e	0	1000e	0

Timing to process events

- For each scenario 100 digitization jobs each with 100 events were processed at the CAF LSF queue





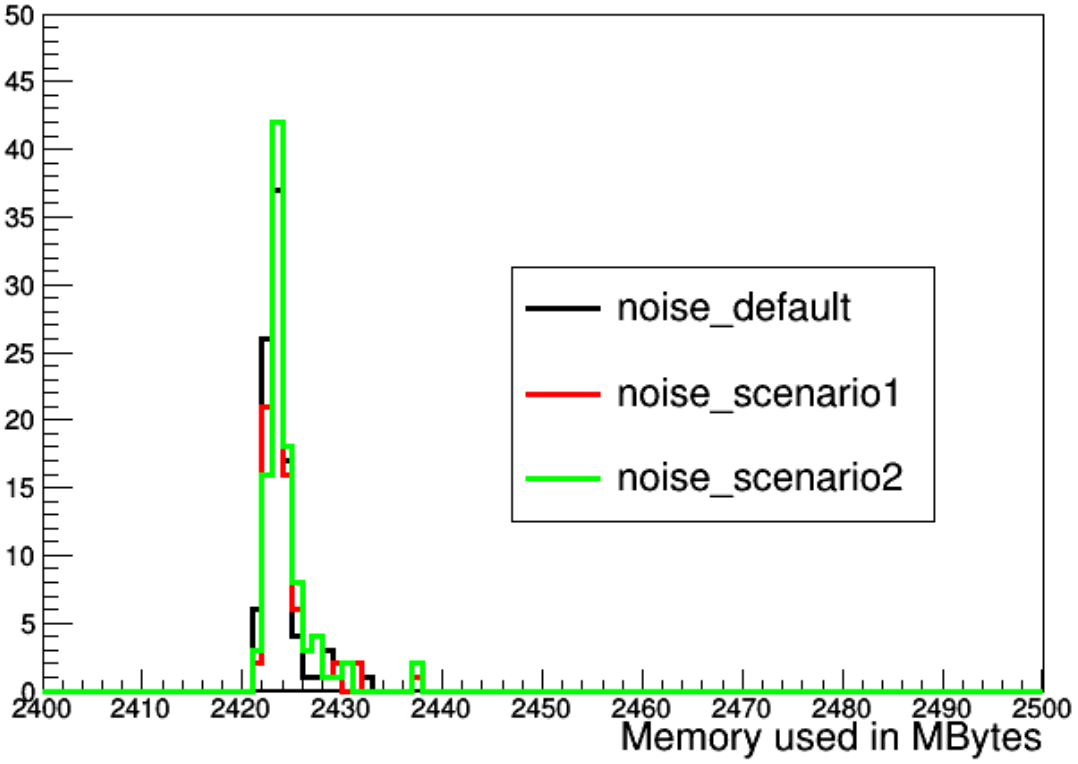


- The timings look similar although the default one looks a bit lower. To test it further a single virtual machine used where 1000 events were digitized in each scenario and we get the following

	Minimum Time (sec)	Average Time (sec)	Maximum Time (sec)
Default	9.5	10.2	20.5
Scenario 1	9.5	10.4	16.1
Scenario 2	9.4	10.4	16.2

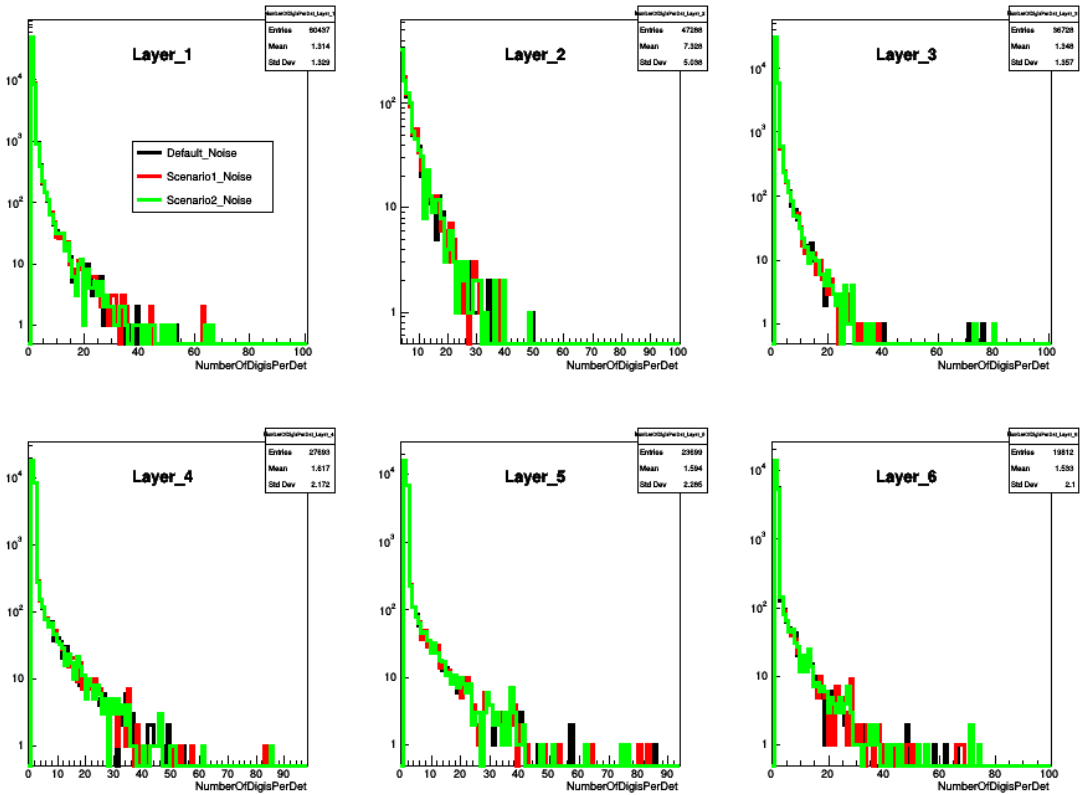
Very similar timings!

Memory usage (MBytes)

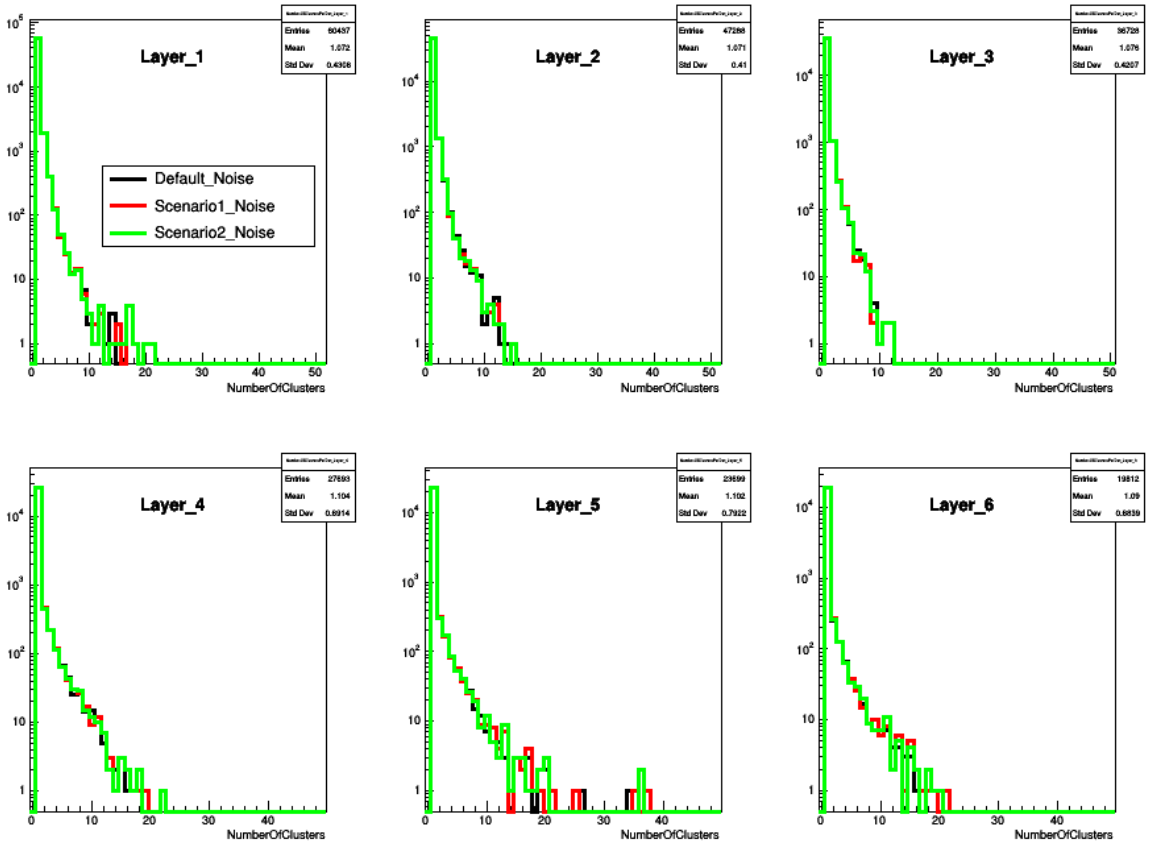


Memory usage is also very similar in all three scenarios!

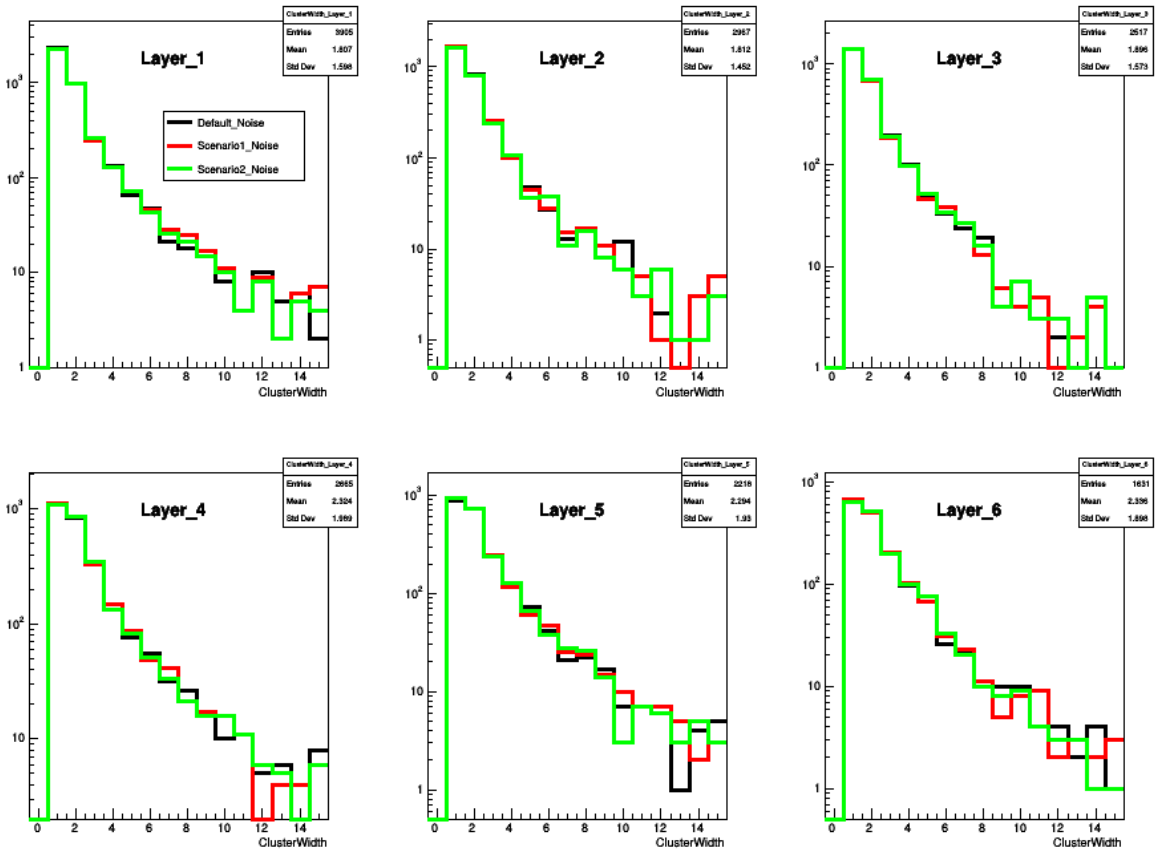
Number of Digis (OT Barrel Layers)



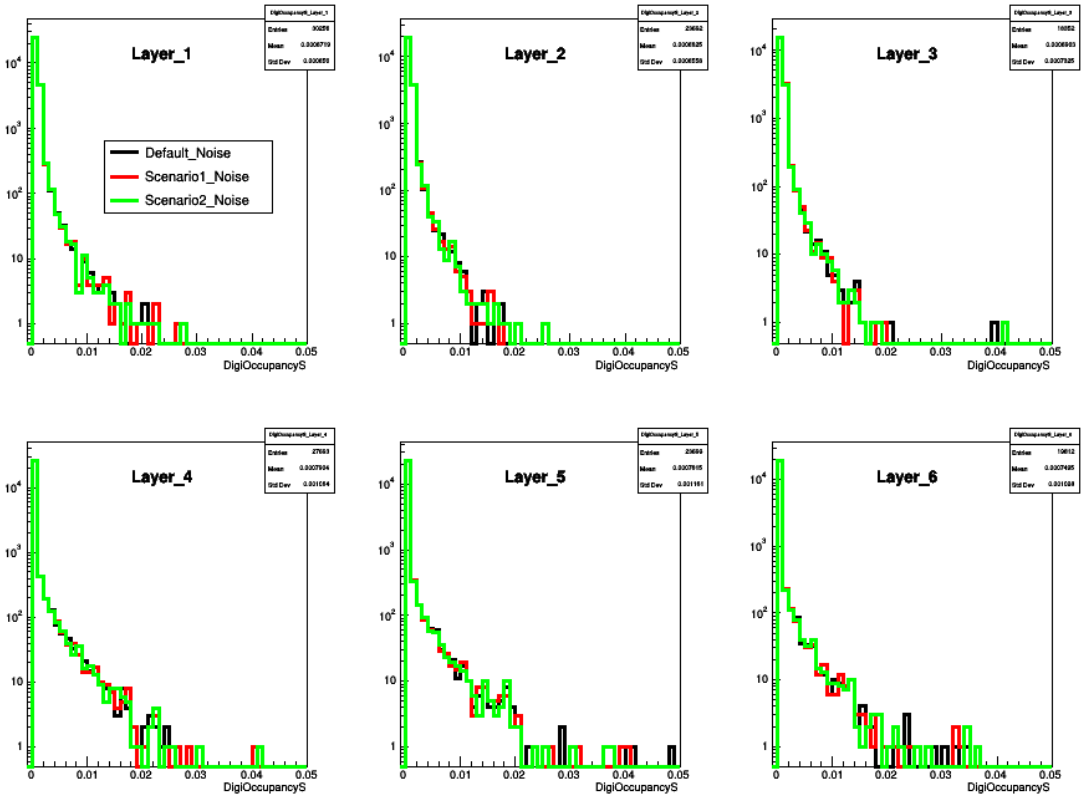
Number of Clusters (OT Barrel Layers)



Cluster Width (OT Barrel Layers)



Occupancy in Strip modules (2S/PSS)



Summary

- So far the noise parameters in the digitizer were not very realistic
  - For 2S modules it was realistic
  - PSP and PSS modules it was higher (1000) compared to the realistic ones (200, 700)
- Implication on timiming and memory usage checked
  - They are very similar in all three cases
- Digi properties also compared
  - No sizable difference found

We should update the noise parameters to more realistic values

  - Scenario #1