

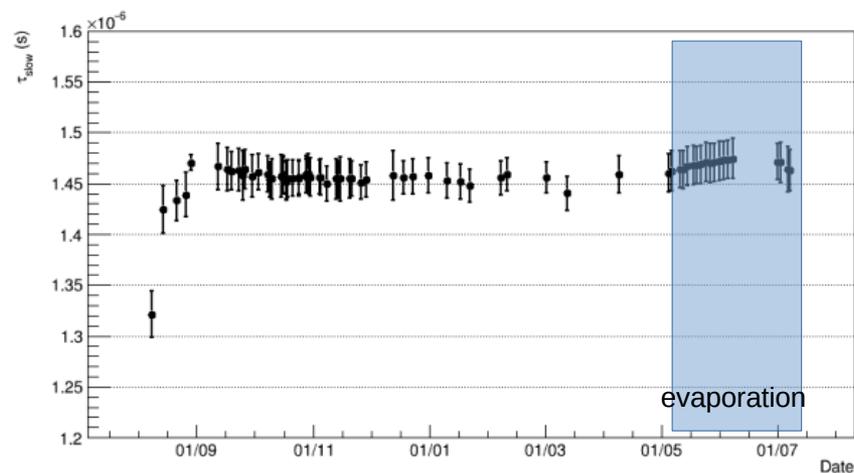
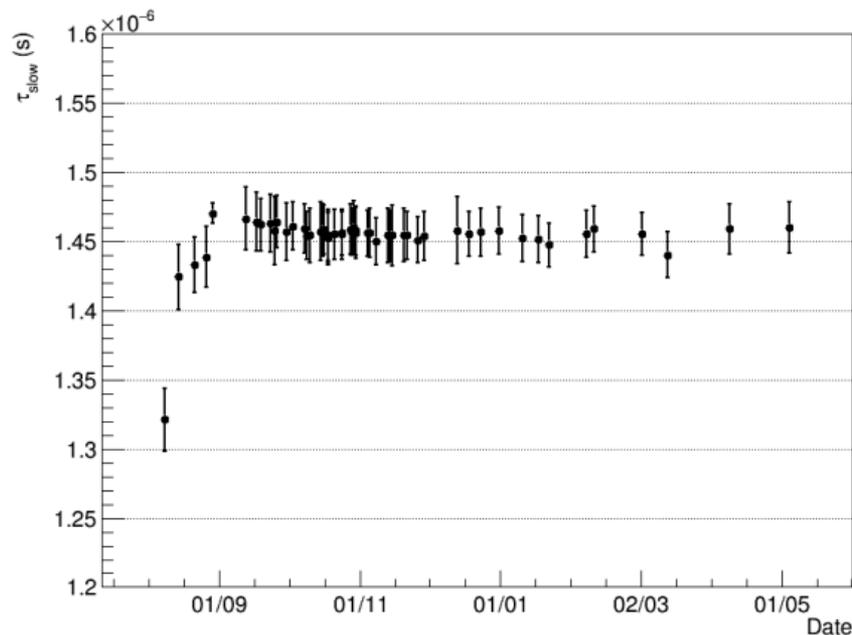
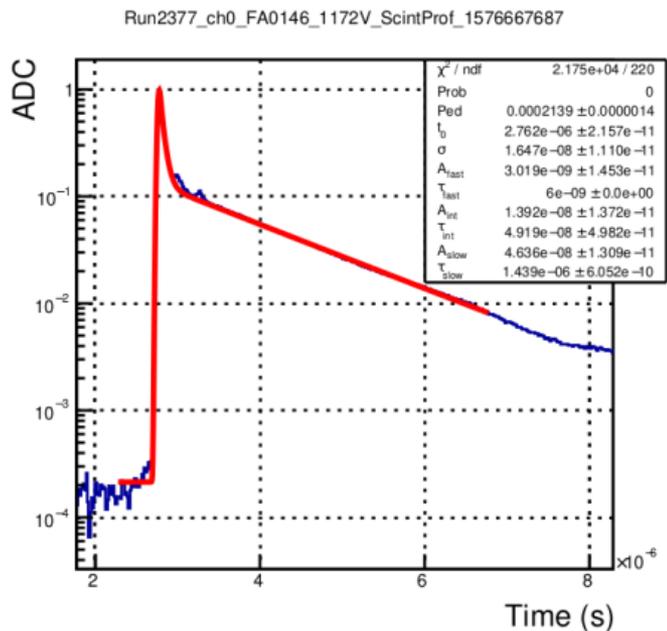
Plots proposed for the light paper

J. Soto

DPPD

23-03-2021

Purity – Tau slow monitoring



Timing

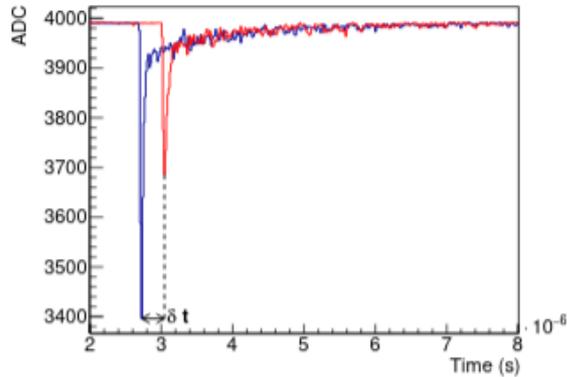


Figure 2: Example of two waveforms of two PMTs for the same event. By comparing the timing of both S1 scintillation light signals we can measure the relative timing accuracy among these two PMTs. S1 signal on the second PMT has been manually shifted to illustrate the example.

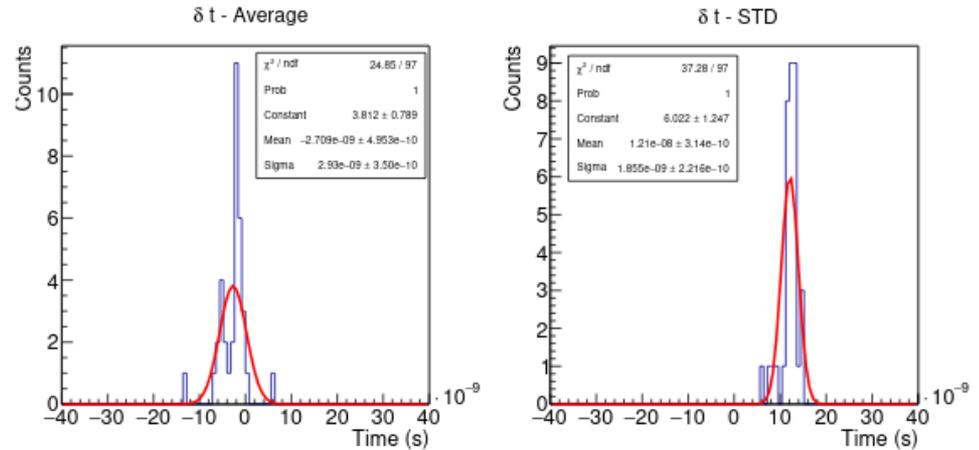
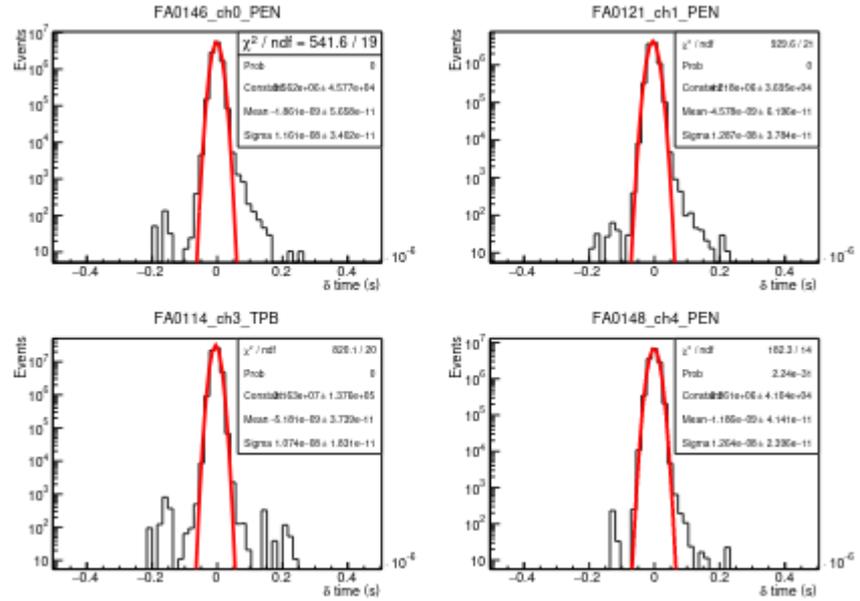
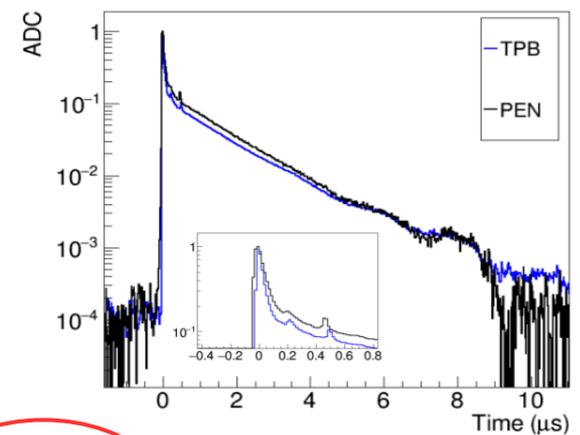


Figure 16: Average δt and σ distribution for all PMTs.

PEN / TPB

- Tau intermediate comparison:



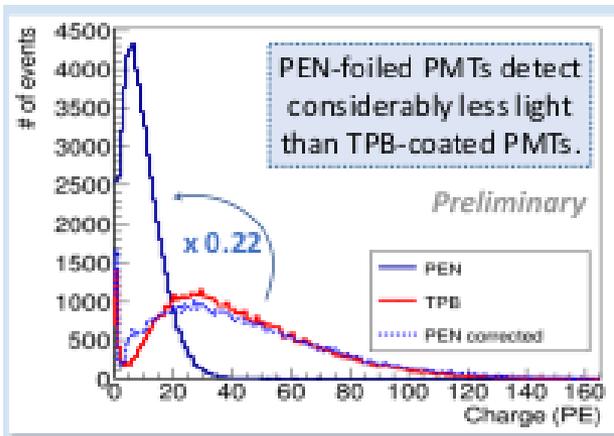
Average of 3 PMTs: 10, 18, 22 (PEN)

$t_{\{0\}}$ (ns)	#sigma (ns)	A {int} (ADCxus)	#tau {int} (ns)	A {slow} (ADCxus)	#tau {slow} (us)	A {transfer} (ADCxus)	#tau {transfer} (us)	A_int/A_tot	A_slow/A_tot	A_trans/Atot	AtotRel
-32.6±0.9	12.3±1.1	1.43±0.06	52±2	4±0	1.44±0.03	-	-	0.261±0.007	0.739±0.007	-	1.00±0.00

Average of 3 PMTs: 21, 33, 9 (TPB)

$t_{\{0\}}$ (ns)	#sigma (ns)	A {int} (ADCxus)	#tau {int} (ns)	A {slow} (ADCxus)	#tau {slow} (us)	A {transfer} (ADCxus)	#tau {transfer} (us)	A_int/A_tot	A_slow/A_tot	A_trans/Atot	AtotRel
-17.1±0.3	8.4±0.1	4.6±0.6	32.4±0.6	15±2	1.44±0.01	-	-	0.232±0.002	0.768±0.002	-	1.00±0.00

- WLS Efficiency.



Set	PMT Pair (PEN - TPB)	Charge ratio PEN/TPB
1	22 - 21	0.233 ± 0.009
	18 - 9	0.262 ± 0.005
2	23 - 20	0.223 ± 0.002
	19 - 33	0.299 ± 0.015
	35 - 9	0.227 ± 0.003

	This study	Literature	Reference
$\epsilon_{PEN}/\epsilon_{TPB}$	0.35 ± 0.009	0.80	[6]
ϵ_{PEN}	0.58 ± 0.18	0.42	[6]
ϵ_{TPB}	>1	0.52	[5]

Xenon

- 4 Profiles.
- Impact in the light yield.

