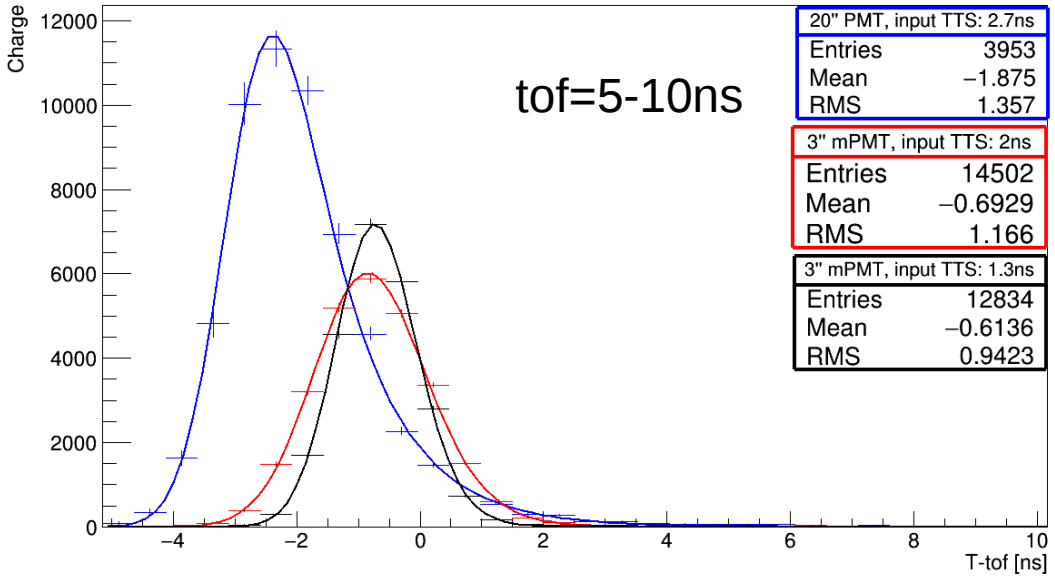
Status report

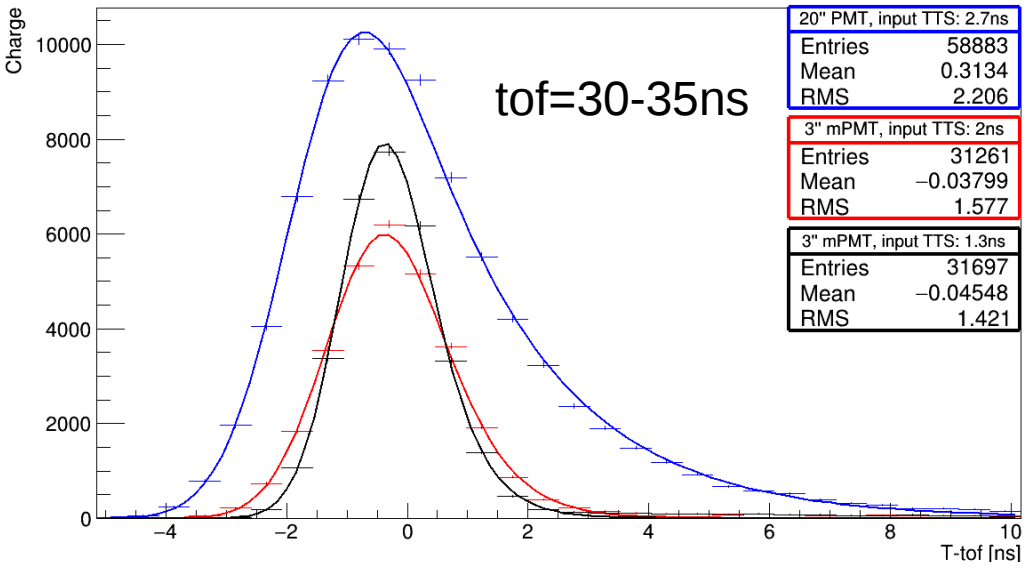
Results using HK simulations
TTS, Quantum Efficiency

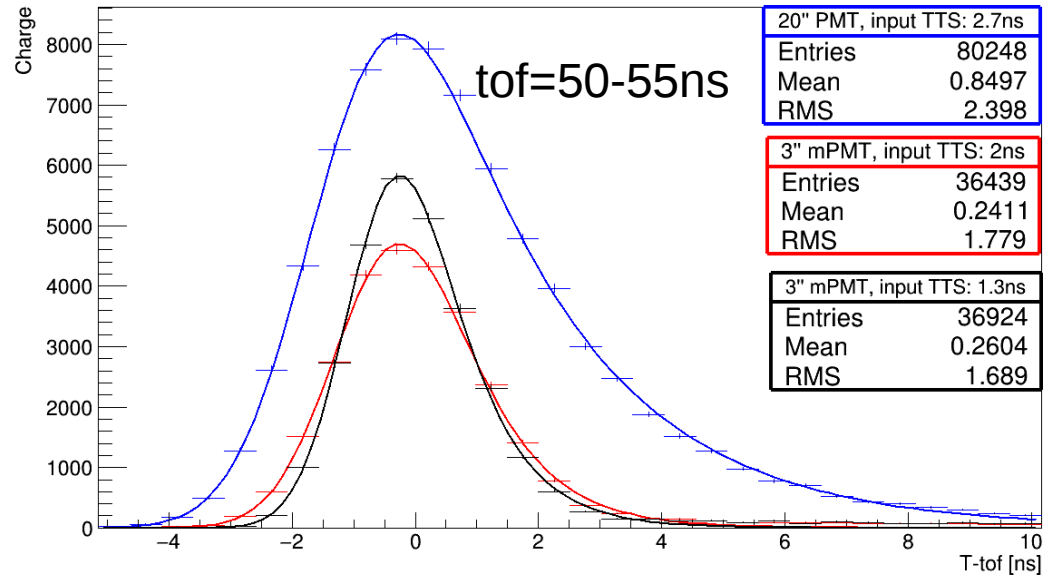
Svetlana Karpova

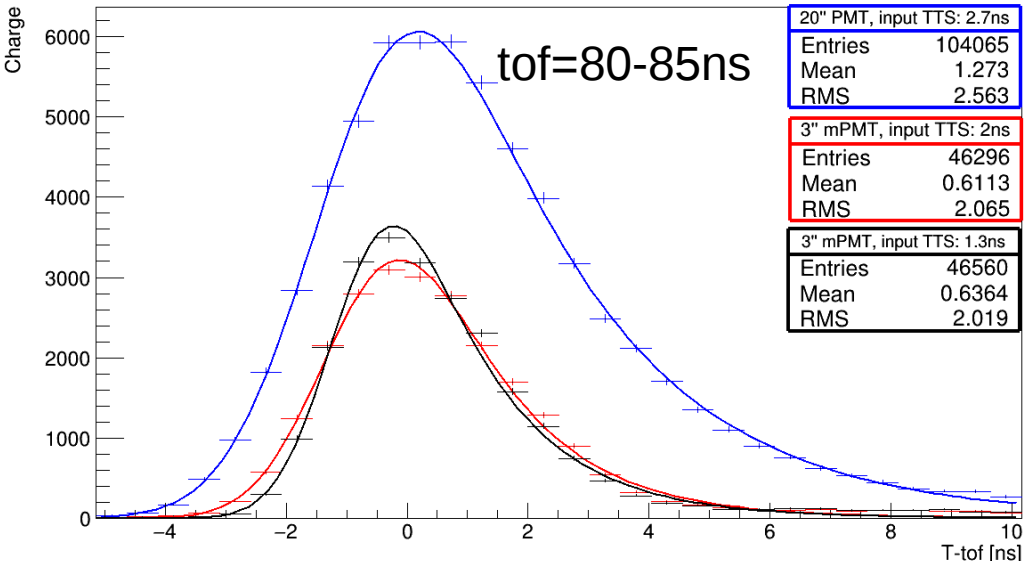
22.11.2018

Projections of 2D histograms









Range ot time-tof (-5;10)

input TTS: 2.7ns	5-10 ns	30-35 ns	50-55 ns	80-85 ns
20” μ	-2.97	-1.17	-1.41	-1.13
20” σ	0.62	0.95	1.10	1.30
20” λ	0.96	0.49	0.43	0.39
input TTS: 2.0 ns				
3” μ	-1.25	-0.89	-0.91	-1.02
3” σ	0.81	0.86	0.91	1.02
3” λ	2.01	1.48	1.04	0.66
input TTS: 1.3 ns				
3” μ	-1.00	-0.77	-0.81	-1.02
3” σ	0.60	0.66	0.73	0.80
3” λ	3.15	1.87	1.17	0.66

Output TTS (for input TTS = 2.7ns):

5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.46	2.24	2.56	3.06

Output TTS (for input TTS = 2.0ns):

5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.90	2.03	2.15	2.40

Output TTS (for input TTS = 1.3ns):

5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.40	1.54	1.71	1.87

In this range the function is not fitted so well. Chi square is large.

Range of time-tof (μ – 3*σ; μ + 3*σ)

input TTS: 2.7ns	**5-10 ns**	**30-35 ns**	**50-55 ns**	**80-85 ns**
20’’ μ	-2.84	-1.60	-1.35	-1.10
20’’ σ	0.70	1.01	1.12	1.32
20’’ λ	1.19	0.55	0.45	0.39
input TTS: 2.0 ns				
3’’ μ	-1.15	-0.65	-0.82	-1.14
3’’ σ	0.85	0.95	0.96	0.97
3’’ λ	2.63	2.61	1.17	0.52
input TTS: 1.3 ns				
3’’ μ	-0.87	-0.74	-0.87	-1.26
3’’ σ	0.64	0.67	0.71	0.69
3’’ λ	5.71	2.01	0.98	0.36

Output TTS (for input TTS = 2.7ns):

5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.64	2.37	2.63	3.10

Output TTS (for input TTS = 2.0ns):

5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.99	2.22	2.25	2.28

Output TTS (for input TTS = 1.3ns):

5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.50	1.58	1.66	1.62

The function is fitted better,
but still output TTS are not the same like input.

Range (μ – 3*σ; μ + 3*σ)

input TTS: 1.7ns	5-10 ns	30-35 ns	50-55 ns	80-85 ns
3’’ μ	-0.85	0.27	0.72	1.49
3’’ σ	0.78	0.81	0.85	0.93
3’’ λ	3.16	1.94	0.99	0.51
input TTS: 1.4 ns				
3’’ μ	-0.73	0.25	0.62	1.37
3’’ σ	0.68	0.72	0.71	0.78
3’’ λ	4.41	2.05	0.82	0.43

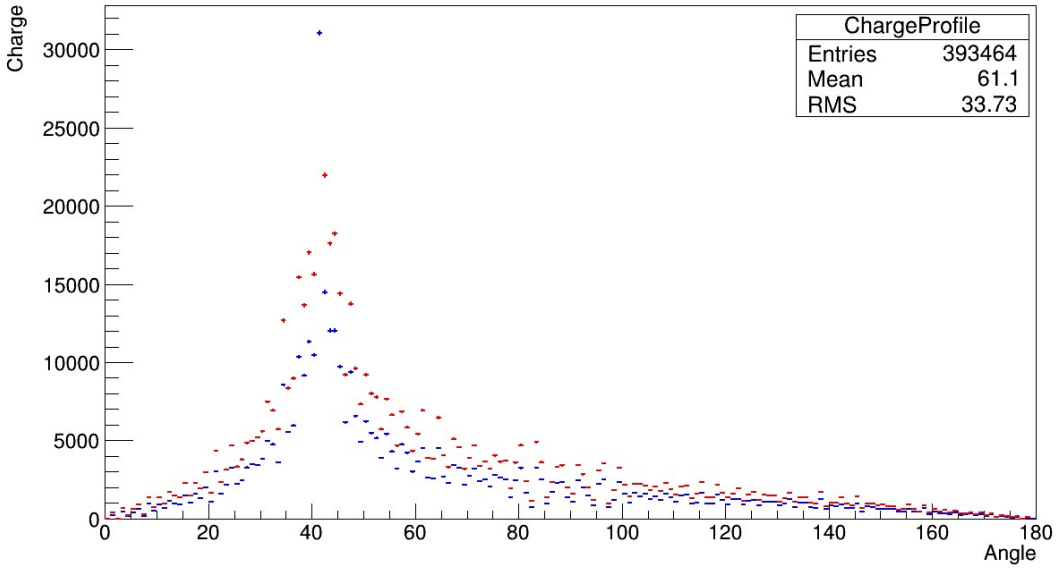
Output TTS (for input TTS = 1.7ns):

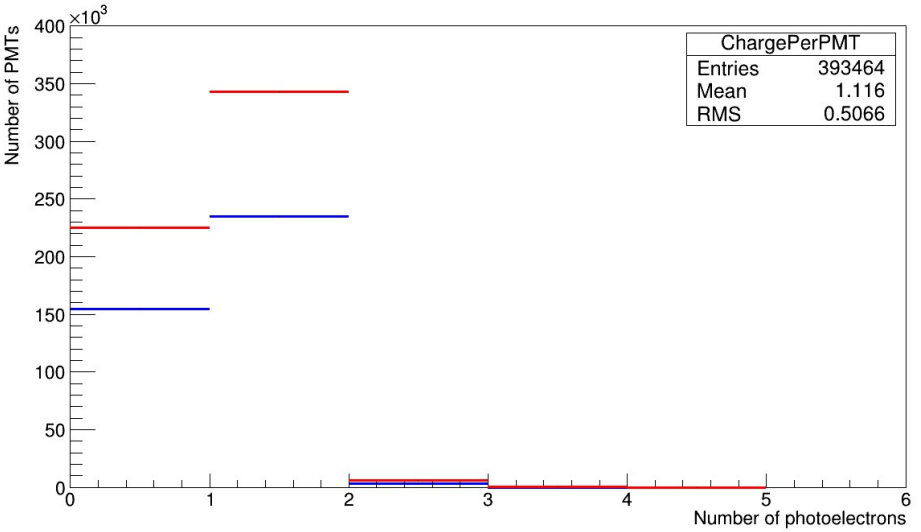
5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.82	1.91	1.99	2.18

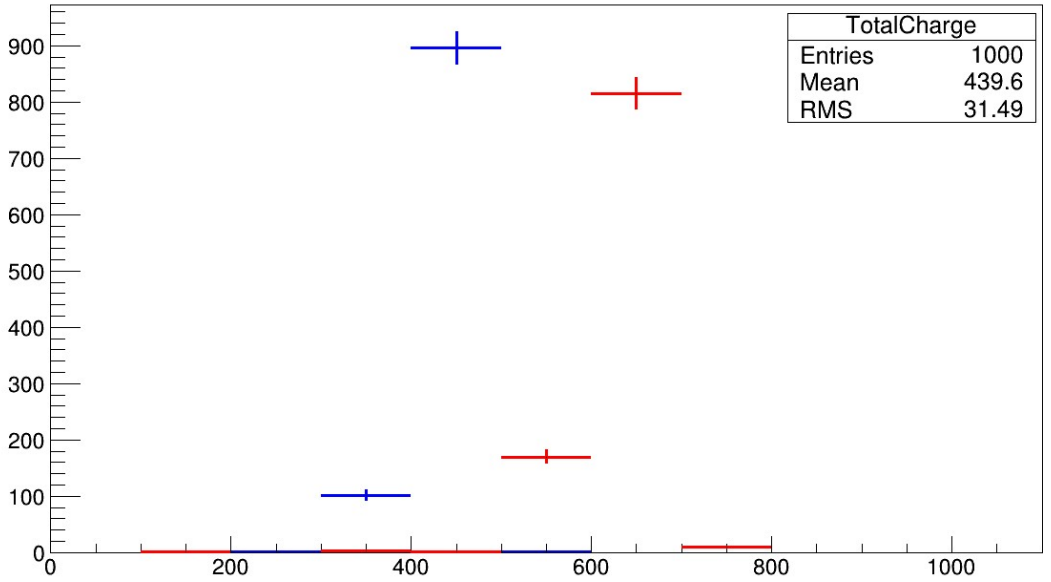
Output TTS (for input TTS = 1.4ns):

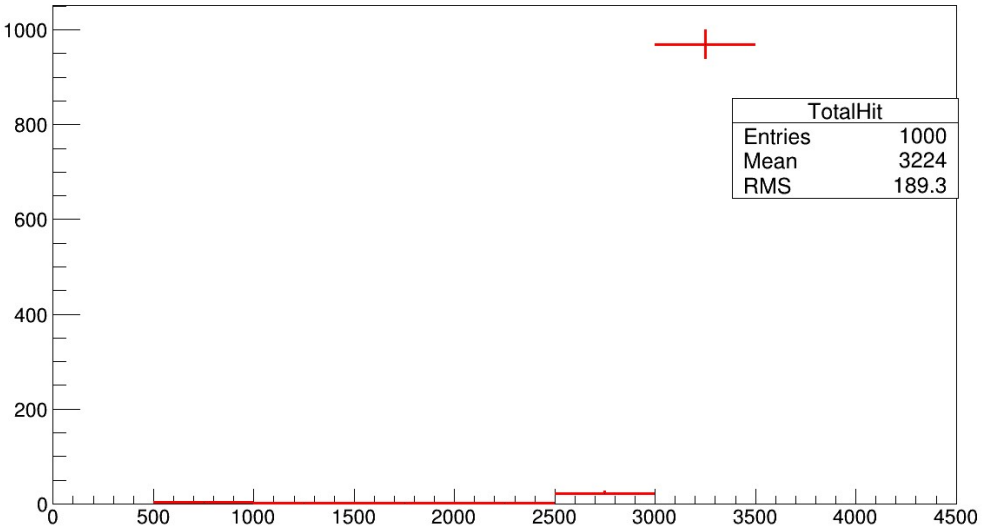
5-10 ns	30-35 ns	50-55 ns	80-85 ns
1.60	1.69	1.68	1.82

5% mPMT, 1000e-, 500MeV, center, QE, QE+50%









Conclusions

- TTS: output is not agree with input.
- The charge increases with increasing QE.

Next steps:

- Investigate the problem with output TTS