Using Pulser Signals in place of detector signals and measuring fluence with SEUSS

The percent difference in the table indicates the order of magnitude of the upper limit of the expected systematic error in measured fluence during an actual run.

	1/8/20			2/4/21			Feb. 2022		
	Pulser Frequency = 53.2 kHz			Pulser Frequency = 1.531 kHz			Pulser Frequenc 1.0 kHz		
Pulser Frequency	53200			1531					
time (sec)	60	300	900	60	300	900	59.8	300	900
Measured Counts (SEUSS)	3175000	15980000	47920000	92510	460200	1379000	59731	299460	899567
Calculated Counts	3192000	15960000	47880000	91860	459300	1378000	59715	299206	899065
Percent Difference	0.53%	0.13%	0.08%	0.71%	0.20%	0.07%	0.03%	0.08%	0.06%

	Pulser Frequency = 12.5 kHz			Pulser Frequency = 14.246 kHz			Pulser Frequency= 10 kHz		
Pulser Frequency	12500			14246					
time (sec)	60	300	900	60	300	900	60	300	900
Measured Counts (SEUSS)	747300	3750000	11200000	857100	4272000	1.3E+07	601440	3017600	9049333
Calculated Counts	750000	3750000	11250000	854800	4274000	1.3E+07	601290	3017254	9047207
Percent Difference	0.36%	0.00%	0.45%	0.27%	0.05%	0.08%	0.02%	0.01%	0.02%

	Pulser Frequency=2.58 kHz			Pulser Frequency = 62.175 kHz			Pulser Frequency= 60 kHz		
Pulser Frequency	2580			62175					
time (sec)	60	300	900	60	300	900	60	300	900
Measured Counts (SEUSS)	155000	773000	2320000	3745000	18650000	5.6E+07	3609000	18062000	54160000
Calculated Counts	154800	774000	2322000	3731000	18650000	5.6E+07	3608369	18051281	54140000
Percent Difference	0.13%	0.13%	0.09%	0.37%	0.00%	0.04%	0.02%	0.06%	0.04%

Using Pulser Signals Originating in Cave 1 and going through detector signal cables

The percent difference in the table indicates the order of magnitude of the upper limit of the expected systematic error in measured fluence during an actual run.

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	Pulser Frequency=2.56 kHz			Pulser Frequency = 1.531 kHz			Feb. 2022		
Pulser Frequency = 823 Hz	2560			1531			Pulser Frequency = 1.004 kHz		
time (sec)	60	300	900	60	300	900	59.8	300	900
Measured Counts (SEUSS)	153000	771000	2310000	91510	458700	1380000	60000	301500	904200
Calculated Counts	153600	768000	2304000	91960	459300	1378000	5999	301300	904600
Percent Difference	0.0039139	0.003899	0.00260078	0.0049054	0.00130719	0.00145	0.02%	0.05%	0.05%

	Pulser Frequency=11.46 kHz			Pulser Frequency = 14.250 kHz			Pulser Frequency=10.1 kHz		
Pulser Frequency = 6494 Hz	11460			14250					
time (sec)	60	300	900	60	300	900	60	300	900
Measured Counts (SEUSS)	683000	3440000	10300000	852900	4270000	1.3E+07	604870	3026400	9097667
Calculated Counts	687600	3438000	10314000	855000	4275000	1.3E+07	603982	3023345	9089839
Percent Difference	0.0067124	0.000582	0.0013583	0.0024592	0.00117028	0	0.15%	0.10%	0.09%

	Pulser Frequency=53.09 kHz			Pulser Frequency = 62.406 kHz			pulser frequency=60 kHz		
Pulser Frequency = 23810 Hz	53090			62406					
time (sec)	60	300	900	60	300	900	60	300	900
Measured Counts (SEUSS)	3180000	15900000	47800000	3739000	18730000	5.6E+07	3611100	18042000	54133333
Calculated Counts	3185400	15927000	47781000	3744000	18720000	5.6E+07	3610024	18028698	54103200
Percent Difference	0.0016967	0.001697	0.00039757	0.0013364	0.00053405	0.00018	0.03%	0.07%	0.06%

Using Stroboscope to Test PMTs

The percent difference in the table indicates the order of magnitude of the upper limit of the expected systematic error in measured fluence during an actual run.

	Strobe Frequency = 59.66 Hz			Strobe Frequency = 60.003 Hz			Feb. 2022 Strobe Frequency = 60 Hz		
	59.66			60					
time (sec)	60	300	900	60	300	900	60	300	900
Measured Counts (SEUSS)	3580	17900	53690	3576	17970	53880	3599	18170	53930
Calculated Counts	3579.6	17898	53694	3600	18000	54000	3596	17990	53920
Percent Difference	0.01%	0.01%	0.01%	0.67%	0.17%	0.22%	0.06%	1.00%	0.01%

	Strobe Frequency = 169.6 Hz			Intermediate frequency test not performed	Intermediate frequency test not performed
	169.6				
	60	300	900		
Measured Counts (SEUSS)	10100	50900	153000		
Calculated Counts	10176	50880	152640		
Percent Difference	0.75%	0.04%	0.24%		

	Strobe Frequency = 400.4 Hz			Strobe Frequency = 413.07 Hz			Strobe Frequency = 400 Hz		
	400.4			413.07					
time (sec)	60	300	900	60	300	900	60	300	900
Measured Counts (SEUSS)	23900	120000	360000	24710	123900	370500	24030	120300	360800
Calculated Counts	24024	120120	360360	24784	123921	371763	24010	120100	360600
Percent Difference	0.52%	0.10%	0.10%	0.30%	0.02%	0.34%	0.05%	0.14%	0.05%