Status of Analysis of August Testbeam data (Penn0,Penn1,Penn2)

Sebastian White HFS meeting August 29, 2017

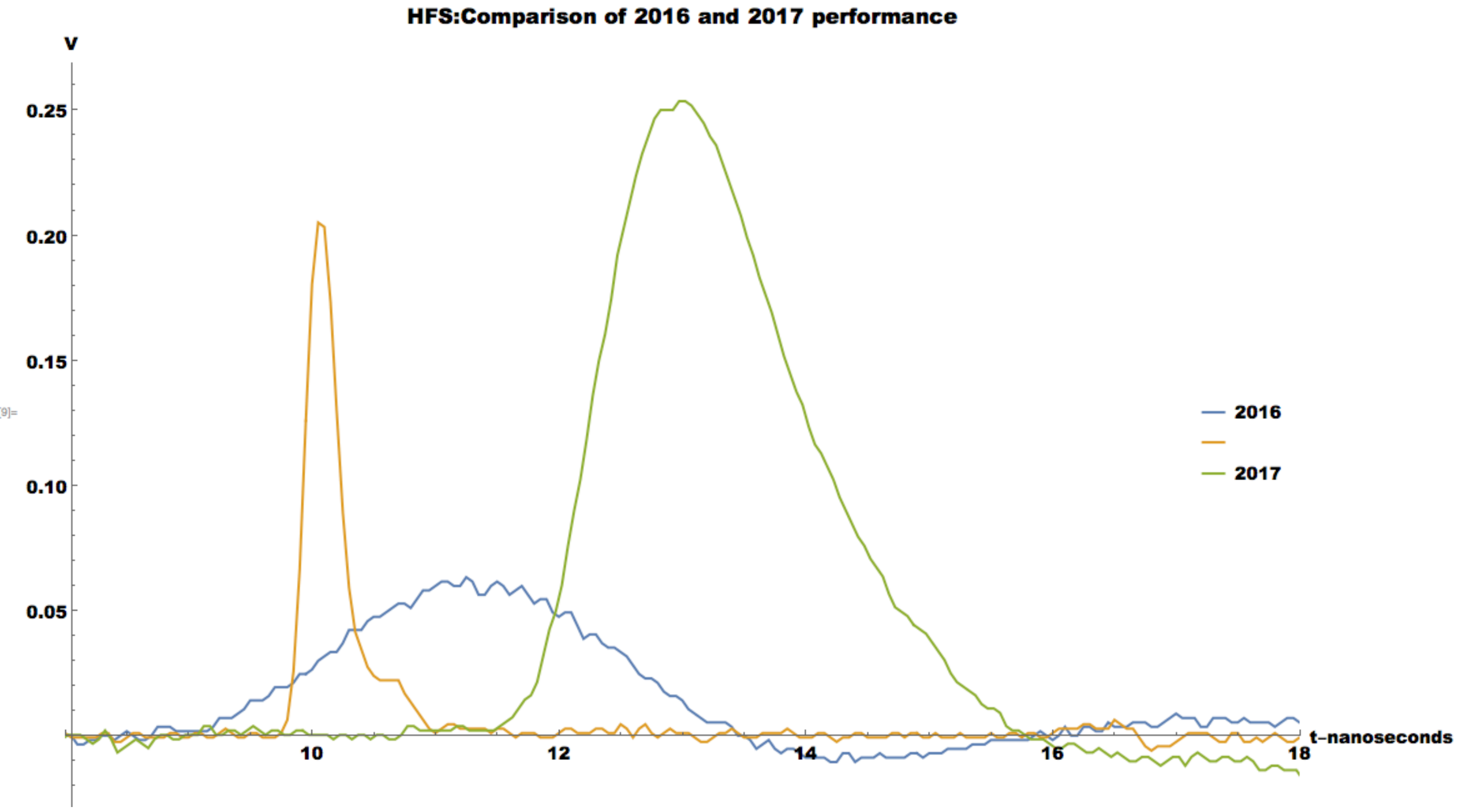
data taking ended last Wednesday due to beam issues after a fruitful 3 week period

GDD student Manuel Guth and Wolfram Research Director of Partnerships, Jesus Herandez (+Lorenzo Moneta) and I have been developing tools for cloud based processing of the data with potential application in Machine learning based on Mathematica (and Mathematica with ROOT)

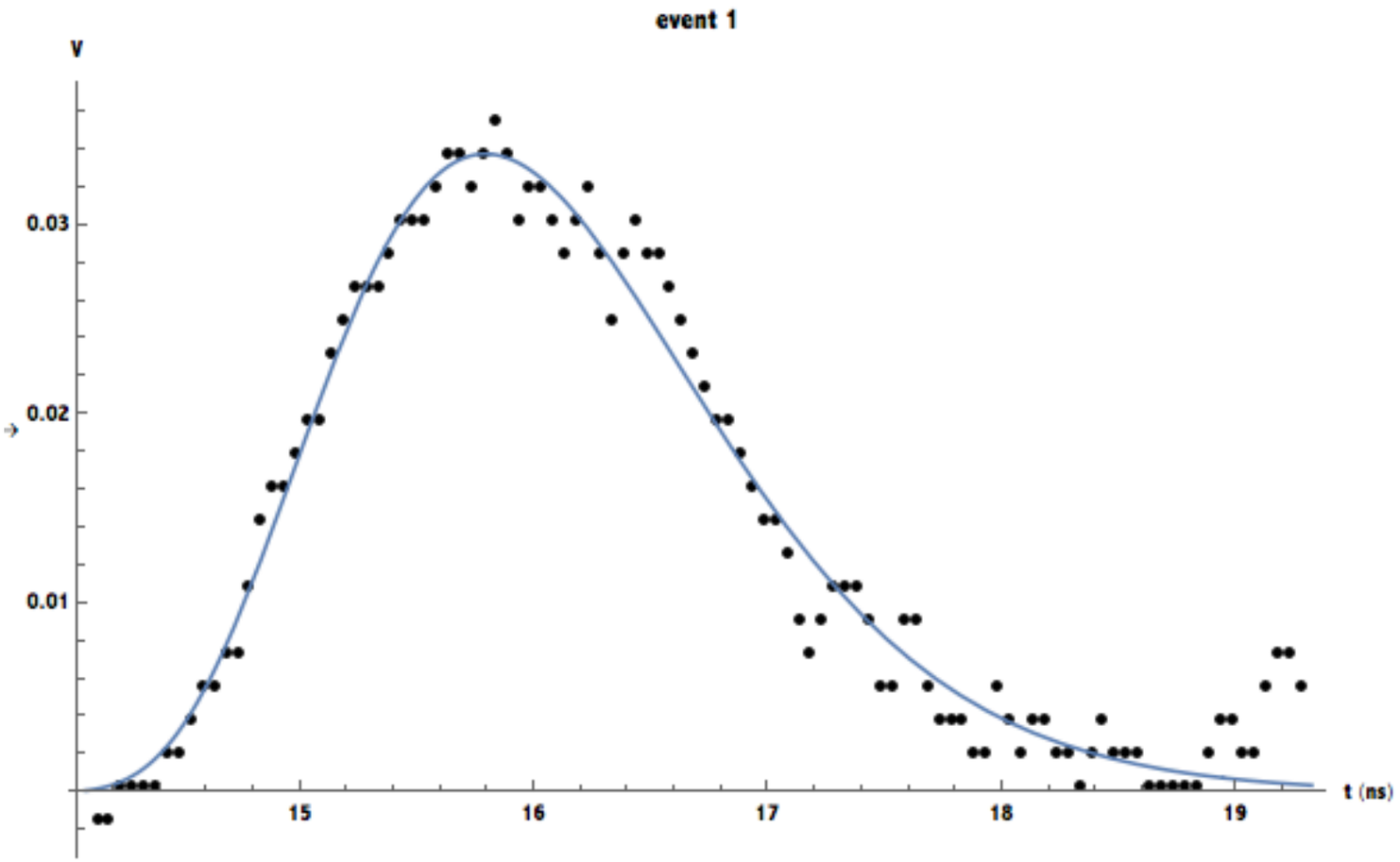
large dataset!

A	B	C	D	E	F	G	H	I	J	K
Run #	**Penn0-HV (I,nAmp**	**Penn1-HV(I,nAmp)**	**Trigger**	**nfiles (evts/file)**	**tracker events**	**PICOSEC0(V_drift,V_MM)**	**Picosec1(V_drift,V_MM)**	**Time res 0 (ps)**	**Time res 1 (ps)**	**comments**
track2		1700-1750	MCP1							folder w. several settings
track4	1750	1728	MCP1							
607						None	None			
609	1750	1750				None	None			before alignment
										(PENN1- RAISED BY 5 MM)
655	1750(170)	1720(390)	Small Scint (5x5mm)	100/file		-225V/+525V	-225V/+525V	87,8 (1,2)	126,5 (1,9)	ignore 1st 4 files- start at evt ~900
656			" "	40(100)		-225V/+525V	-225V/+525V	97,4 (1,5)	129,0 (1,9)	Pico0 = Normal. Pico1 = USTC.
658	" "	" "		24(100)		-225V/+500V	-225V/+500V	95,4 (1,6)	132,9 (2,3)	
659				35(100)		-475V/+275V	-475V/+275V	24,3 (0,4)	30,1 (0,4)	
660				38(100)		-500V/+250V	-500V/+250V	24,9 (0,4)	29,0 (0,4)	
661			" "	31(100)		-475V/+250V	-475V/+250V	32,6 (0,8)	39,6 (0,9)	
663				?		-450V/+250V	-450V/+250V	52,4 (0,7)	63,6 (0,8)	
665						-500V/+200V	-525V/+225V	38,0 (0,5)	26,6 (0,3)	
666	" "	" "	" "	?		-500V/+200V	-500V/+200V	38,3 (0,5)	36,5 (0,5)	
668	1750(170)	1726(387)	Large Scint...	28(200)		None	None			skip 14 files
677	1776	1751	Large Scint...			None	None			
688	1798	1772	Large Scint...			None	None			
704	1799	1749	Small Scint			-475V/+275V	-475V/+275V	41,8 (0.8)	36,4 (0,7)	Pico0 = Normal. Pico1 = Resistive. Pico
705	1799	1749	" "			-475V/+275V	-475V/+275V	44,7 (0,8)	38,1 (0,6)	Pico0 not grounded.
710	1799	1749	" "			-475V/+275V	-475V/+275V	36,1 (0,7)	34,7 (0,5)	Pico0 grounded.
890		1776		1k ev/file						
891		1776								
900										
966	1725	1725	Large							
970	1725	1725	"	40,000 events						
971	1750	1750	"							
972	1775	1775	"							
973	1700	1700	"							

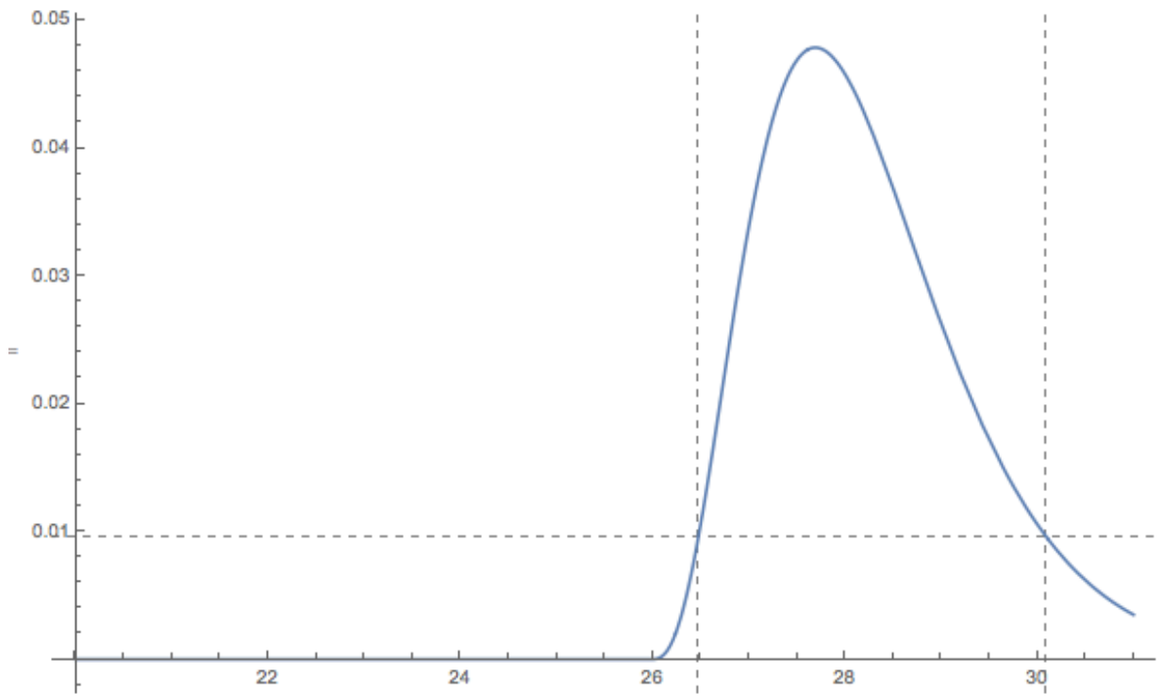
Significant Progress in Last Year!

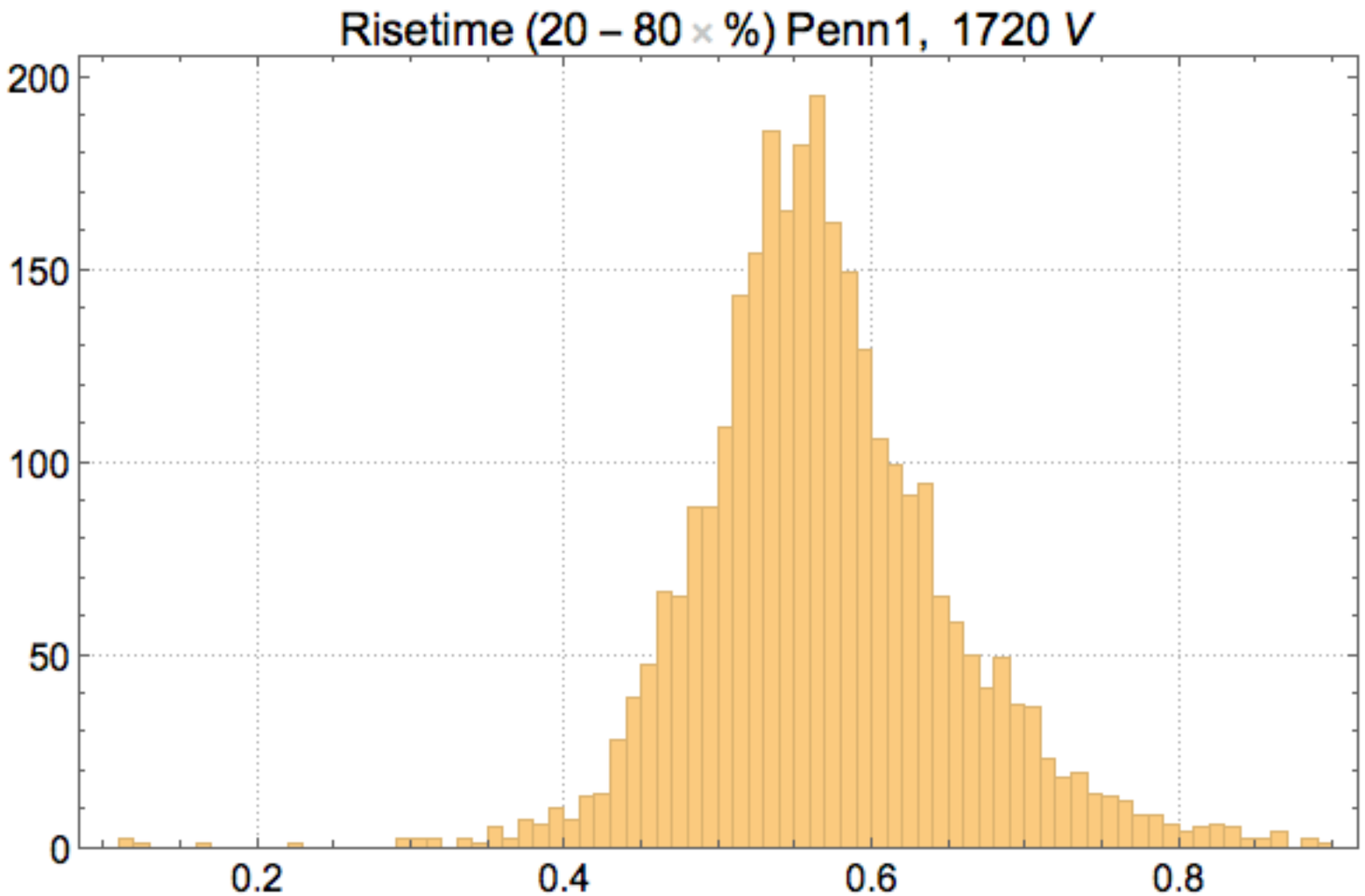


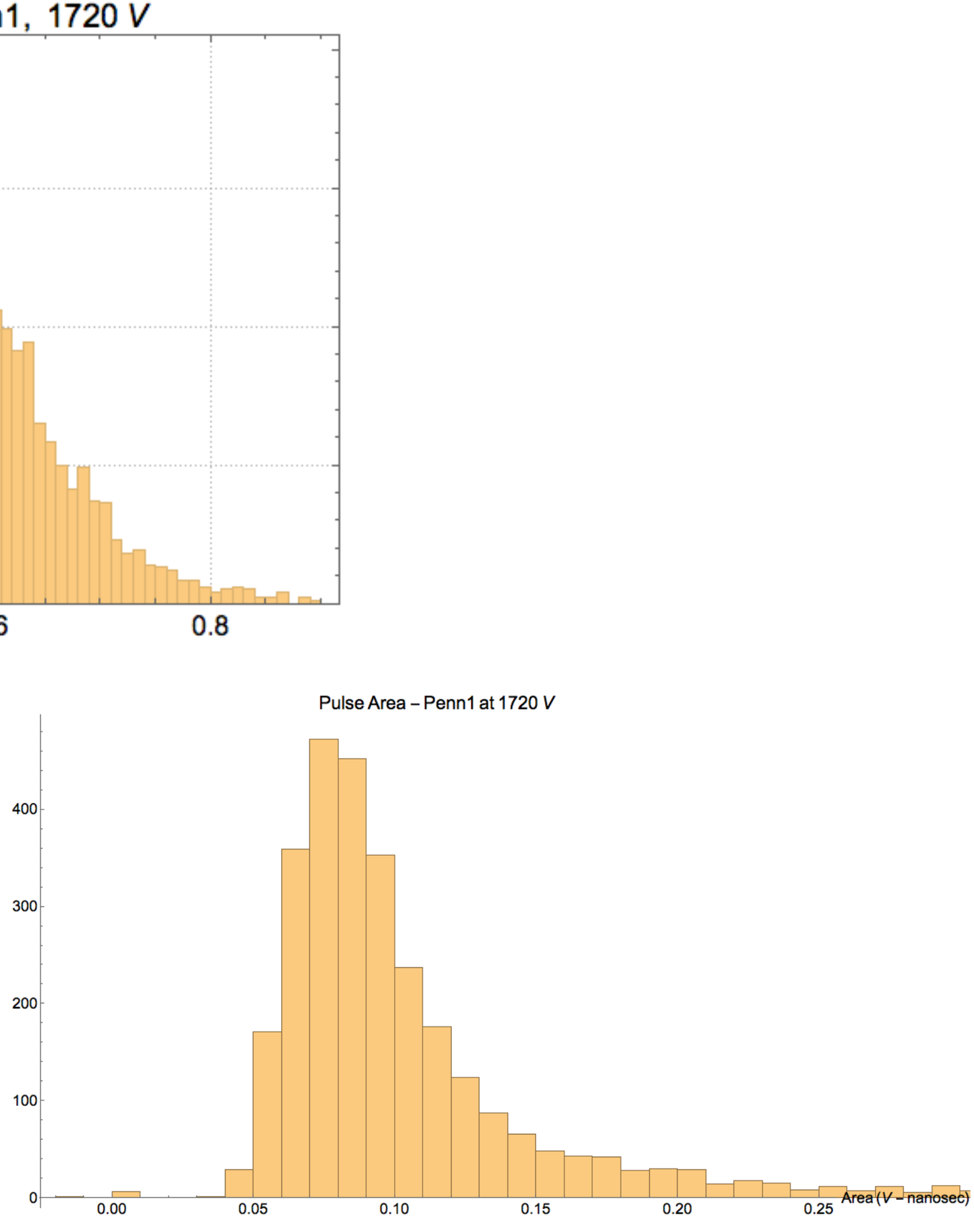
Signal Modeling



experimenting w a number of signal models for MCP, HFS and PICOSEC ie Gaussian Peaking Function, Gamma Distribution




Risetime (20 – 80 × %) Penn1, 1720 V
200
150
100
50
0
0.2
0.4
0.6
0.8
nanosec


Pulse Area – Penn1 at 1720 V
400
300
200
100
0
0.00
0.05
0.10
0.15
0.20
0.25
Area (V – nanosec)