

# Testbeam Data Analysis of Glass Scintillator Tiles

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- Beamtest at CERN
  - Beam: 10GeV  $\mu^-$ , size  $\sim 10\text{cm}$
  - Self-trigger: Channel A + Channel D
  - Amplifier: NDL, 20 dB
  - Sample: 1 plastic scintillator and 11 glass scintillator (CERN1-11)

- Beamtest at DESY
  - Beam: 5GeV  $e^-$ , size  $\sim 1\text{cm}$
  - Ext-trigger: two  $1*1*1\text{ cm}^3$  plastic scintillator tiles
  - Amplifier: SJTU, 20 times
  - Sample: 1 plastic scintillator and 4+9 glass scintillator (CERN8-11 + DESY1-9)

- Same
  - SiPM: S13360-6025PE
  - Oscilloscope: 4-ch, 5G/s

- Using same analysis method

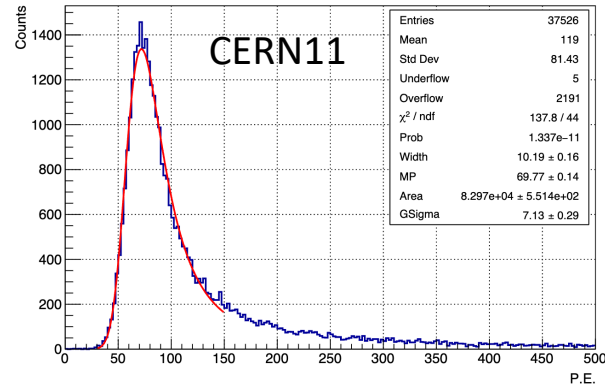
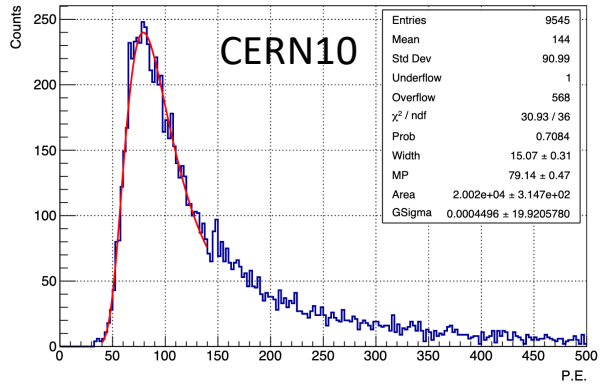
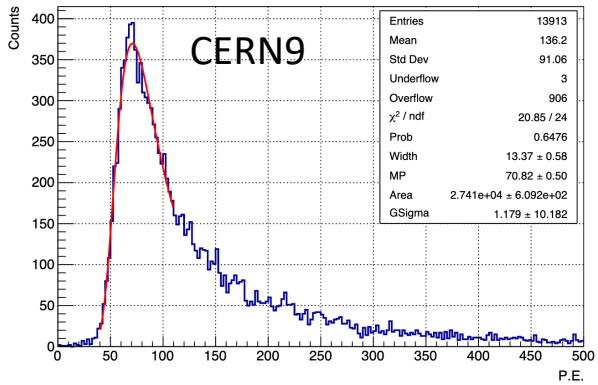
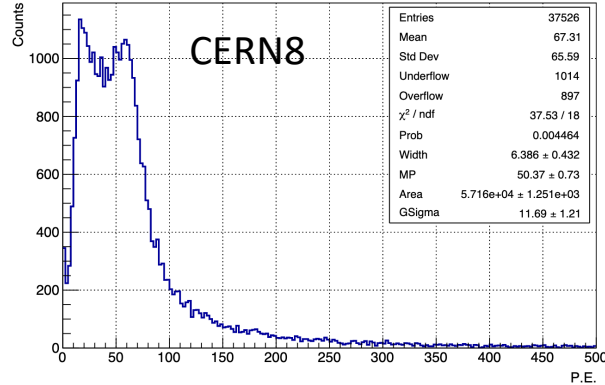
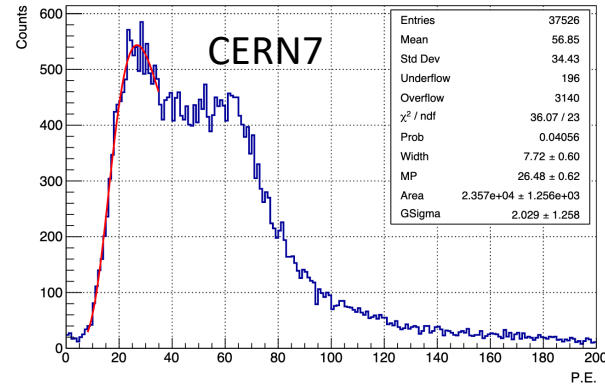
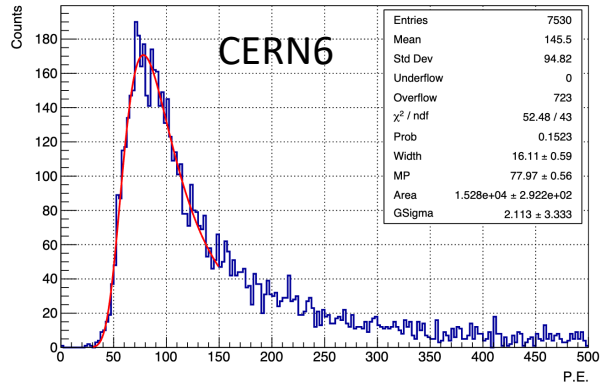
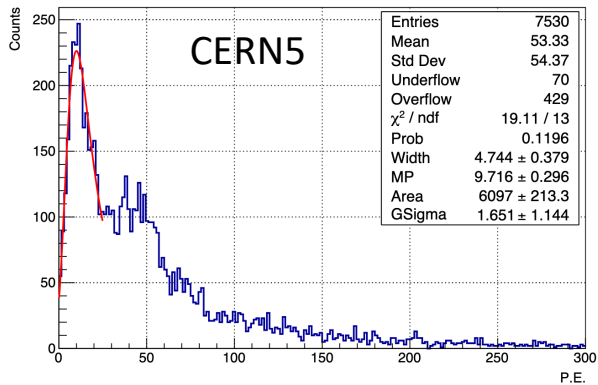
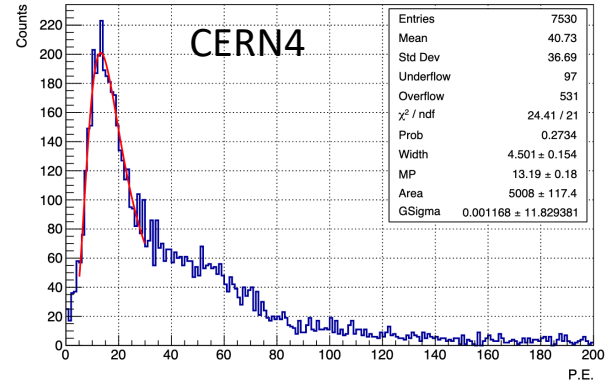
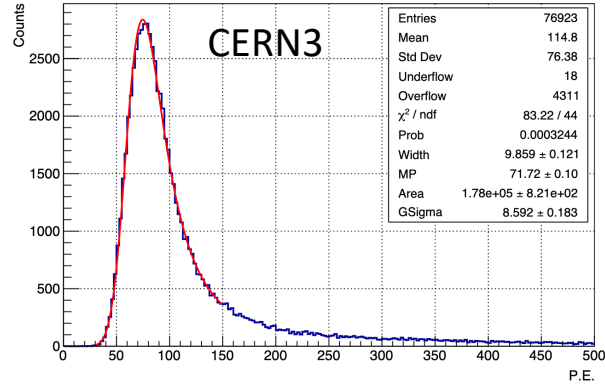
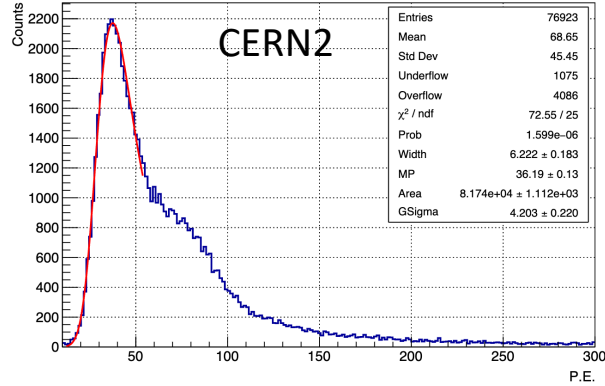
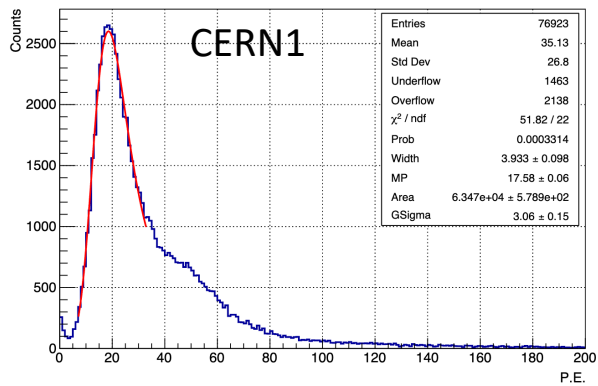
Samples tested at CERN



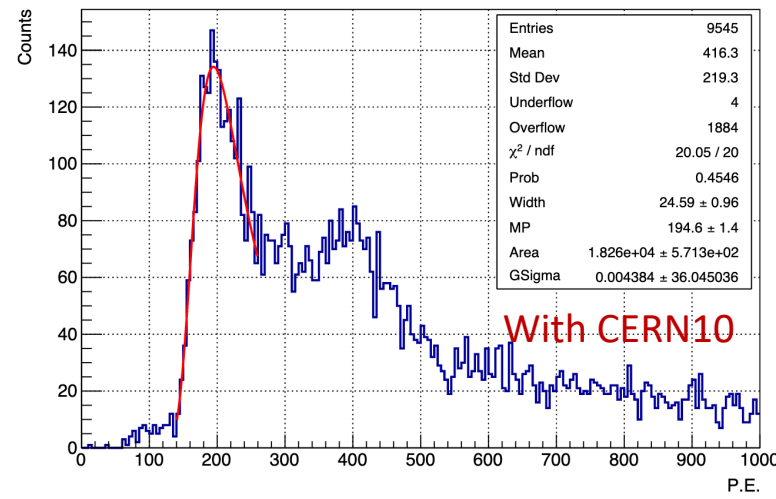
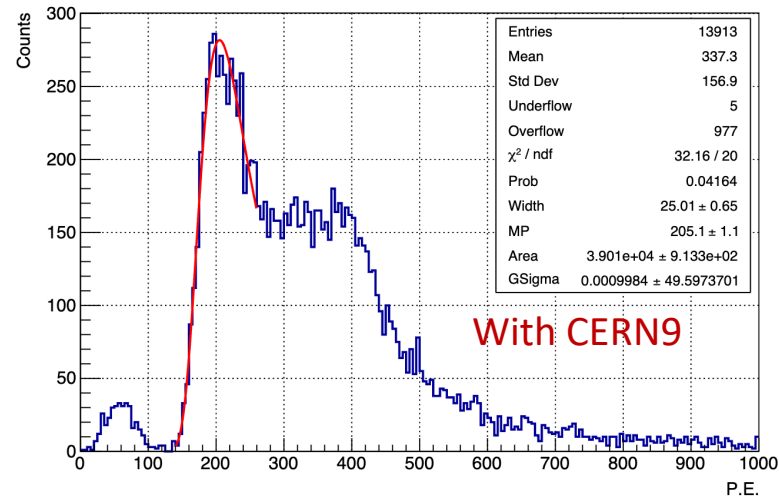
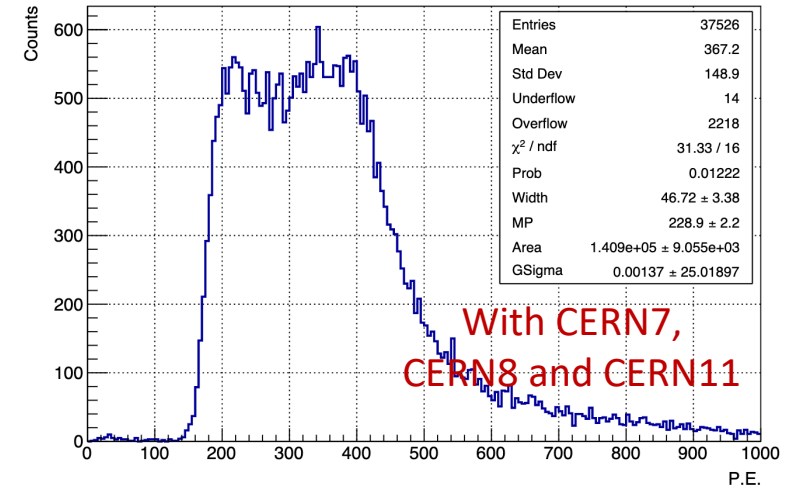
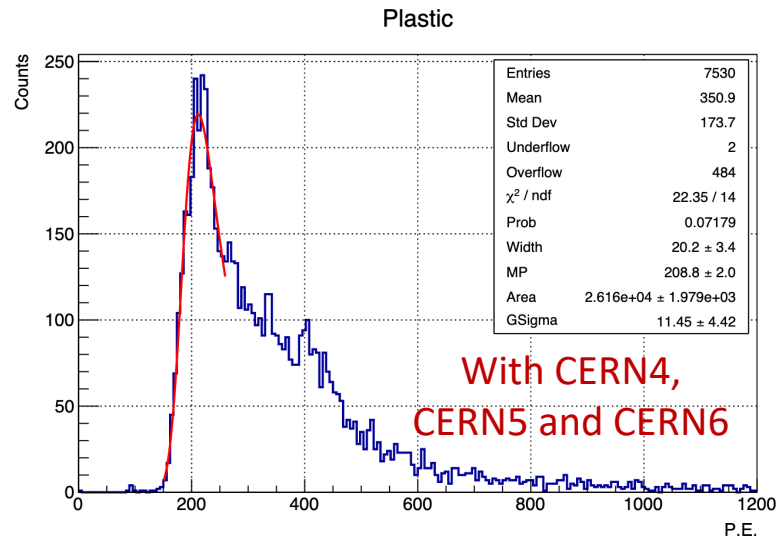
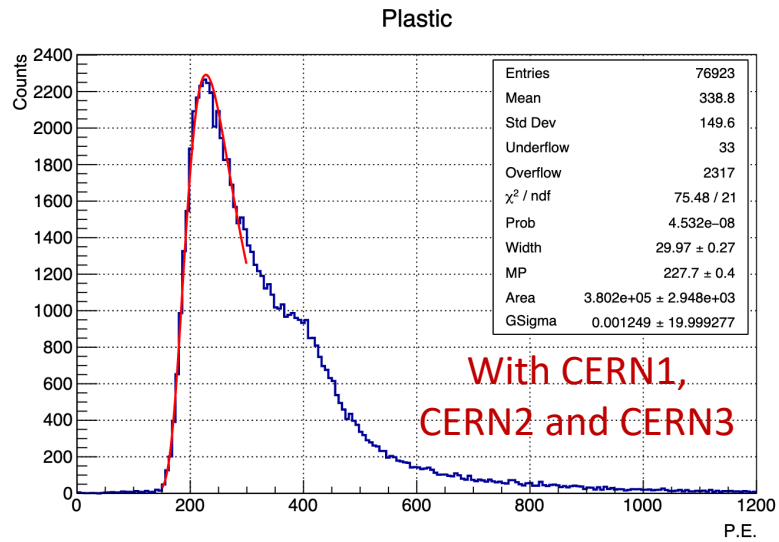
Samples tested at DESY



# CERN Results of Glass Tiles

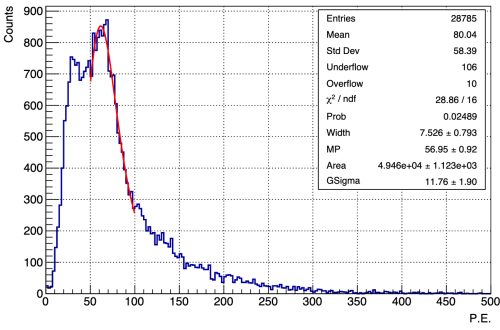


# CERN Results of Plastic Scintillator Tiles

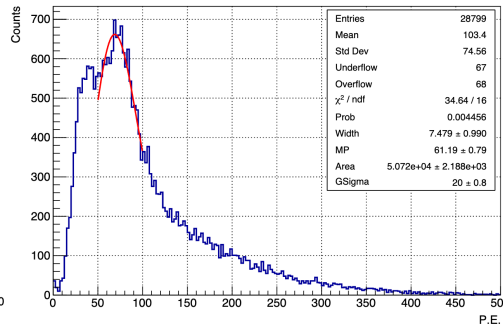


# DESY Results of Glass Tiles

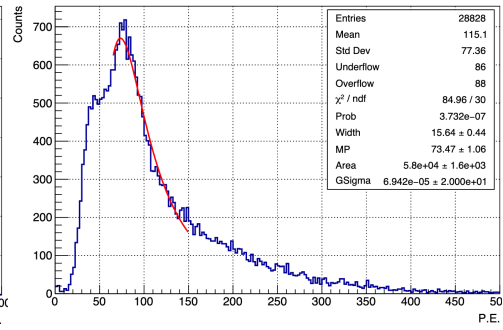
CERN8



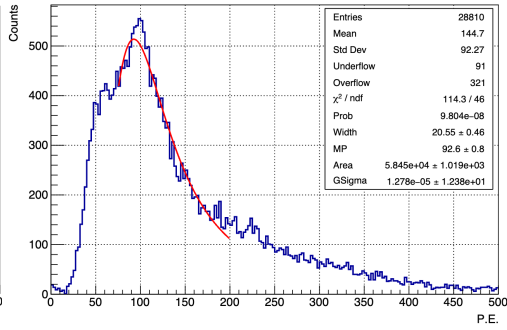
CERN9



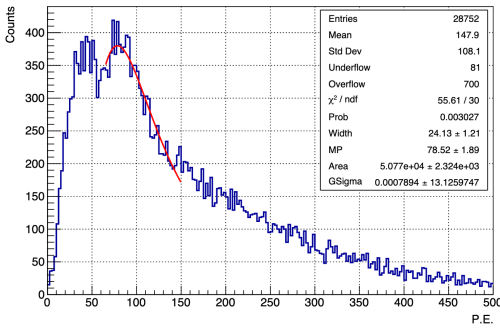
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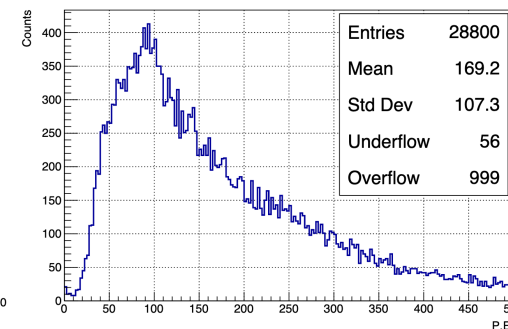
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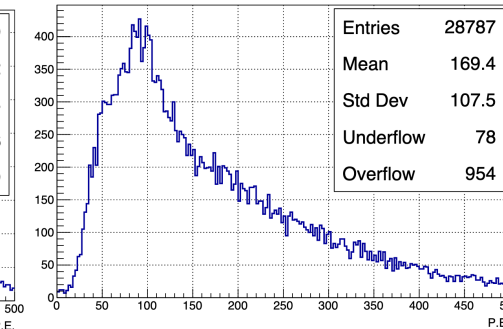
DESY1



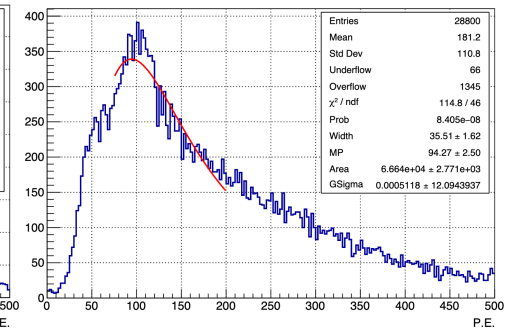
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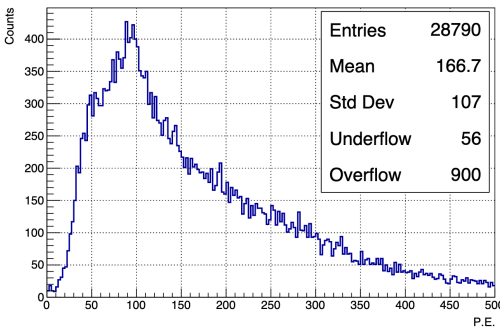
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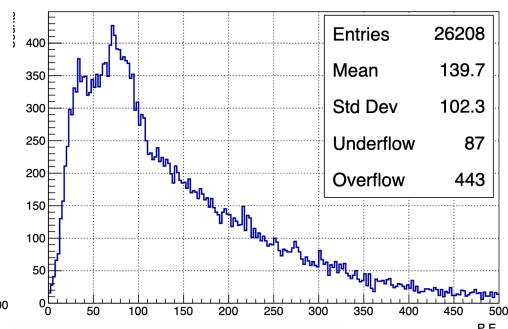
DESY4



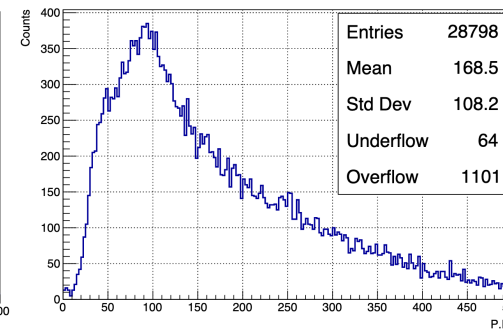
DESY5



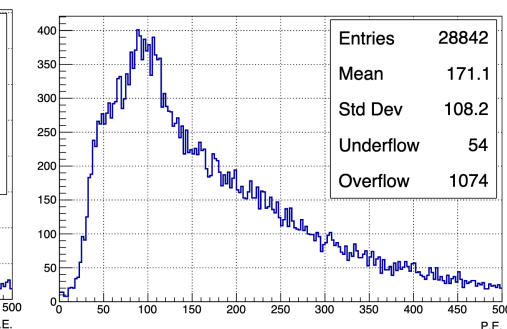
DESY6



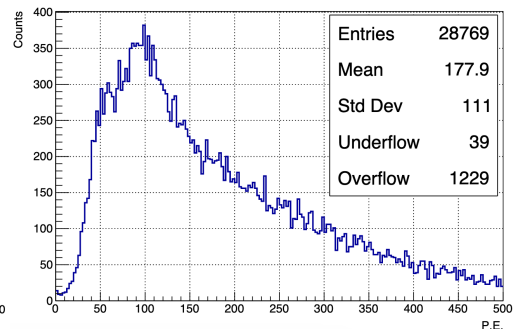
DESY7



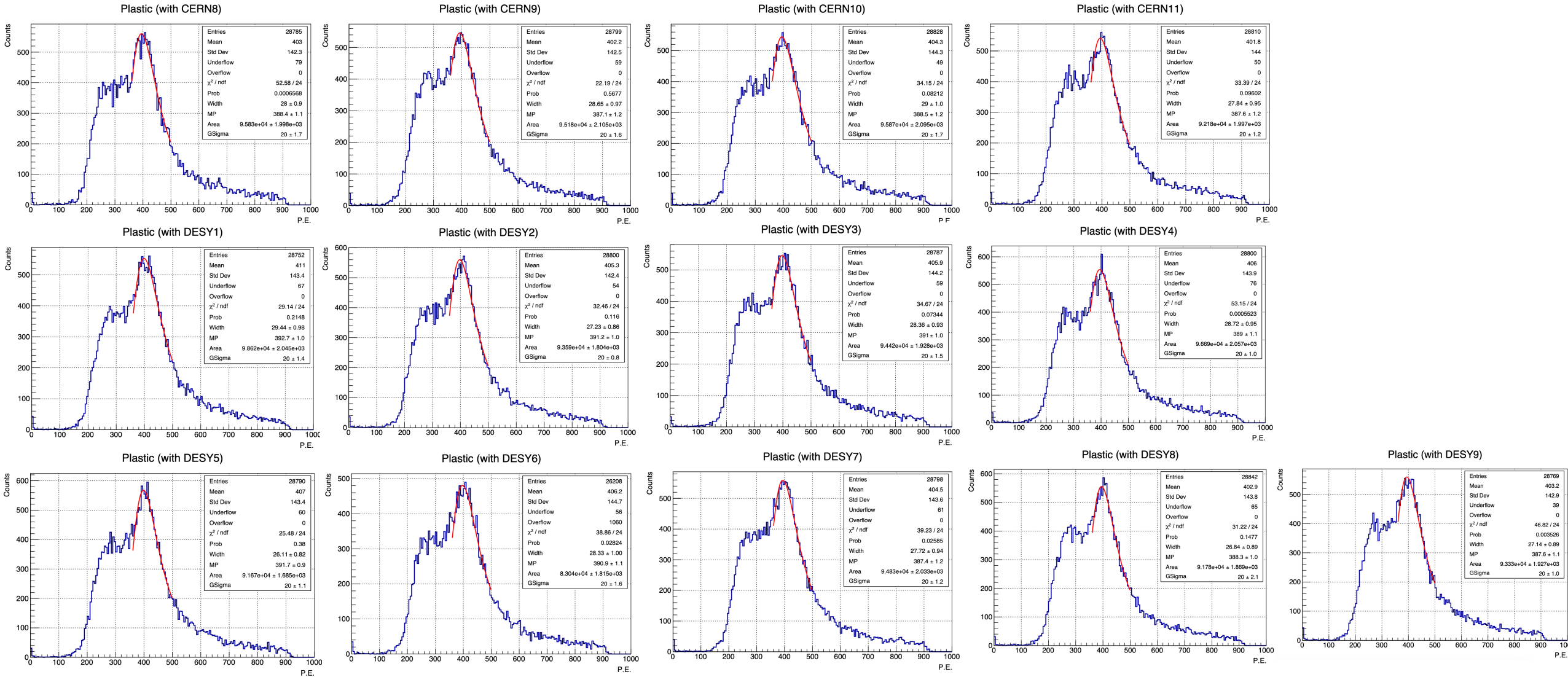
DESY8



DESY9



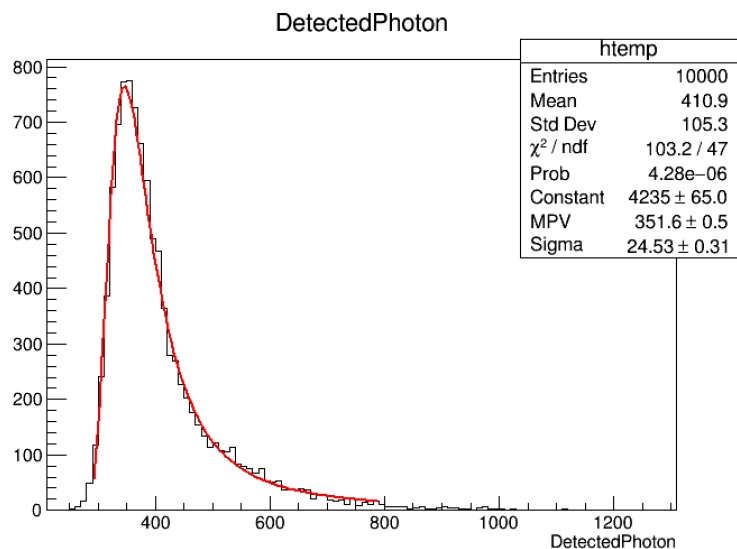
# DESY Results of Plastic Scintillator Tiles



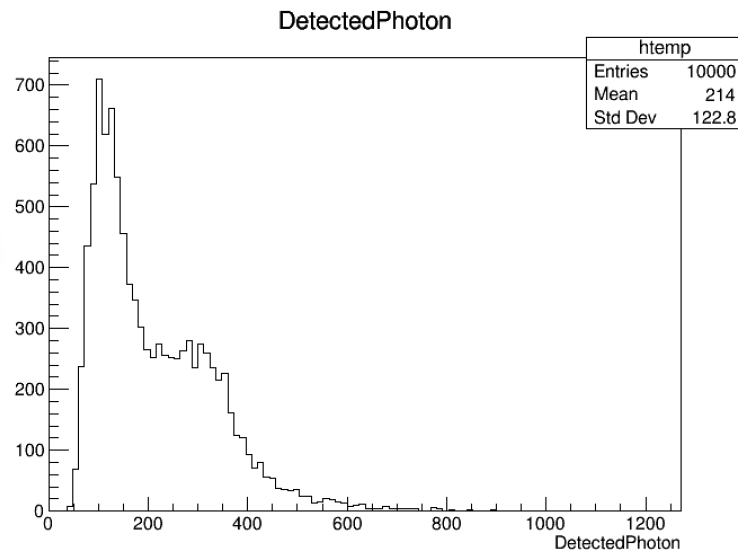
All spectra have the same structure, and MPV ~390 p.e.

# Optical simulation — Plastic scintillator

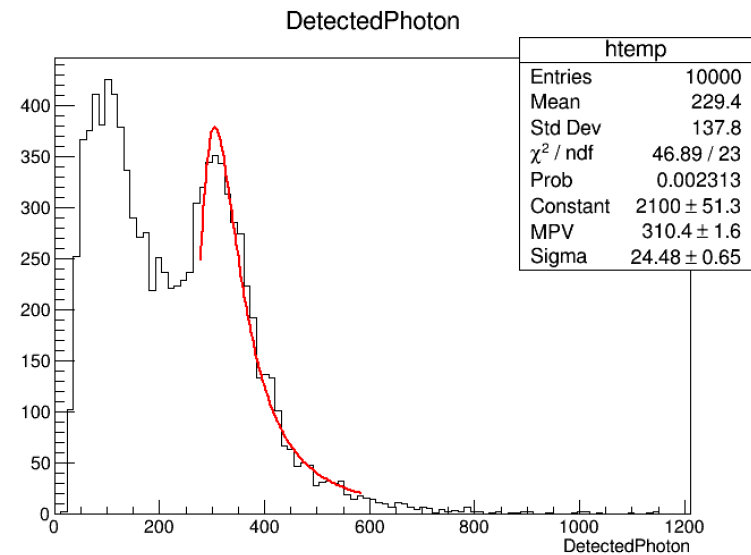
入射位置：中心



入射位置：1\*1cm<sup>2</sup>范围内均匀分布



入射位置：高斯分布，sigma=3mm



Backup



	Composition	Size (mm <sup>3</sup> )	Density (g/cm <sup>3</sup> )	T (%)	LY (ph/MeV)	Decay time (ns)
CERN-1	Gd-Al-B-Si-Ce <sup>3+</sup>	33.5*27.6*5.1	~5.1	69	600	300 (19%), 881
CERN-2	Gd-Ba-B-Si-Ce <sup>3+</sup>	30.2*29.5*6.6	~5.1	61	611	114 (11%), 770
CERN-3	Gd-Ba-B-Si-Ce <sup>3+</sup>	29.9*28.1*10.2	~5.1	70	613	90 (6%), 754
CERN-4	Gd-Ba-B-Si-Ce <sup>3+</sup>	37.2*35.1*5.3	~5.1	80	506	96 (6%), 1024
CERN-5	Gd-Ba-B-Si-Ce <sup>3+</sup>	40.0*35.1*4.2	~5.1	78	407	335 (26%), 1068
CERN-6	Gd-Ba-Al-B-Si-Ce <sup>3+</sup>	30.3*29.8*9.4	~5.1	55	393	134 (5%), 1132
CERN-7	Gd-Ba-Al-B-Si-Ce <sup>3+</sup>	34.8*34.8*7.5	~5.1	65	360	113 (27%), 394
CERN-8	Gd-Ba-Al-B-Si-Ce <sup>3+</sup>	27.8*25.6*5.0	~5.1	81	840	136 (23%), 933
CERN-9	Gd-Ba-Al-B-Si-Ce <sup>3+</sup>	34.6*34.7*7.5	~5.1	49	352	141 (12%), 771
CERN-10	Gd-Ba-Al-B-Si-Ce <sup>3+</sup>	34.7*35.2*7.4	~5.1	64	524	129 (10%), 819
CERN-11	Gd-Ba-Al-B-Si-Ce <sup>3+</sup>	30.5*30.0*8.7	~5.1	81	767	153 (12%), 1085

	T (%@400nm)	Density (g/cm <sup>3</sup> )	LY (ph/MeV)	Size (mm <sup>3</sup> )	Decay time (ns)
DESY#1	16.8	~6	626	40*40*10	116.4 (6.6%), 775.8
DESY#2	76.6	~6	684	40*40*10	104.0 (2.3%), 1046.5
DESY#3	75.4	~6	572	40*40*10	106.8 (2.6%), 988.2
DESY#4	83.8	~6	788	40*40*10	87.0 (1.8%), 1024.3
DESY#5	78.1	~6	674	40*40*10	103.8 (2.1%), 1172.9
DESY#6	64.2	~6	507	40*40*10	95.9 (2.0%), 1037.4
DESY#7	72.8	~6	576	40*40*10	106.4 (2.5%), 997.0
DESY#8	80.7	~6	673	40*40*10	114.4 (4.3%), 1014.0
DESY#9	80.3	~6	768	40*40*10	109.8 (2.6%), 1009.8