



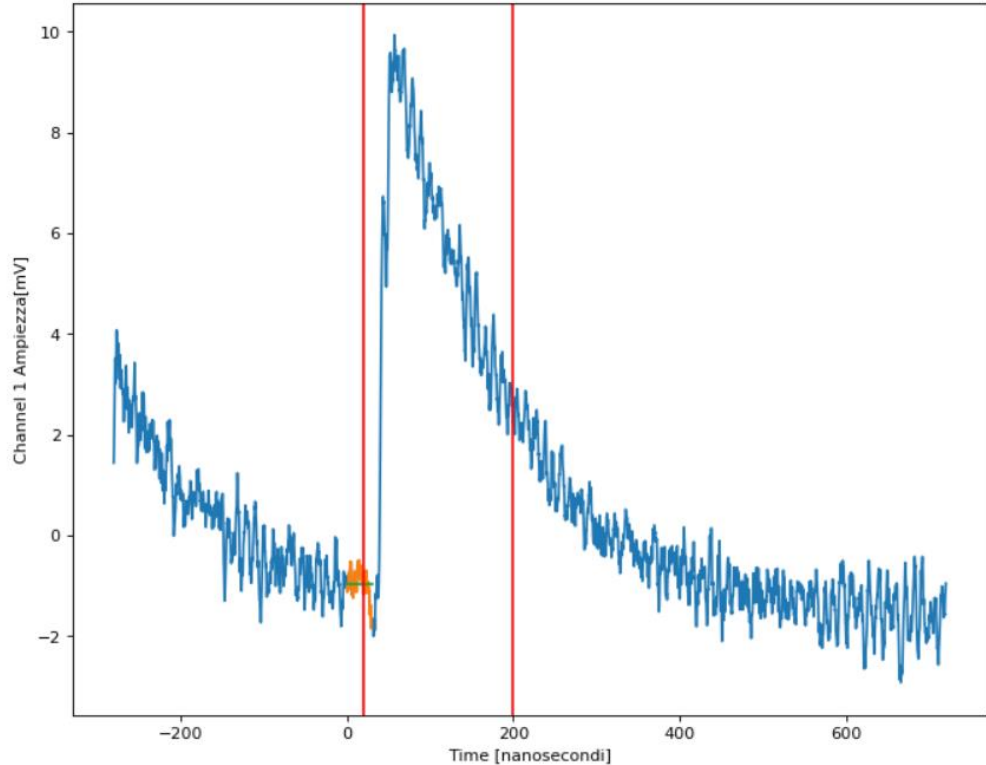
Analisi Test Beam

Update recenti su analisi | 6/10/2024

Lavoro di:
Lucrezia Borriello

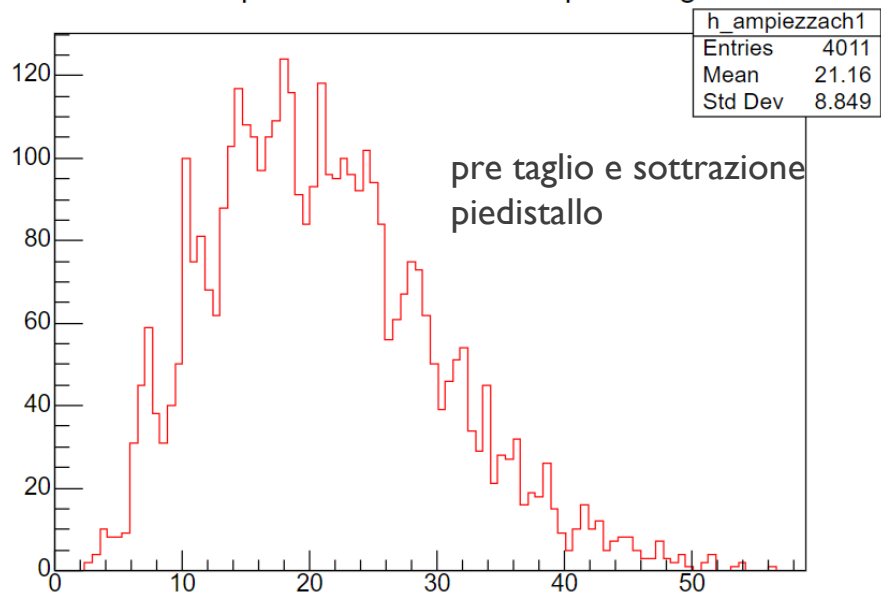
Calibrazioni sipm 6x6 Gain 28

- Alimentazione 40,7V
- Preamplificatore CAEN
labellato con 2
- taglio sulla waveform
 $20 < \text{Time} < 200$
- arancione= piedistallo
che vado a sottrarre

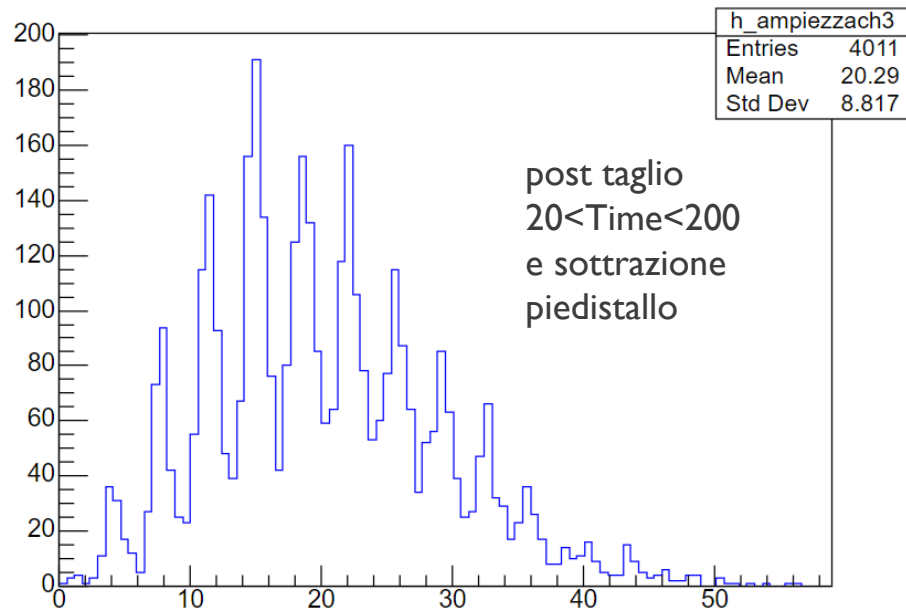


Calibrazioni sipm 6x6 Gain 28

371 run Ampiezza con wf filtrata sipm 6x6 gain 28



371 run Ampiezza con wf filtrata con taglio 20-200 e pedistallo sottratto sipm 6x6 gain 28 filtrato

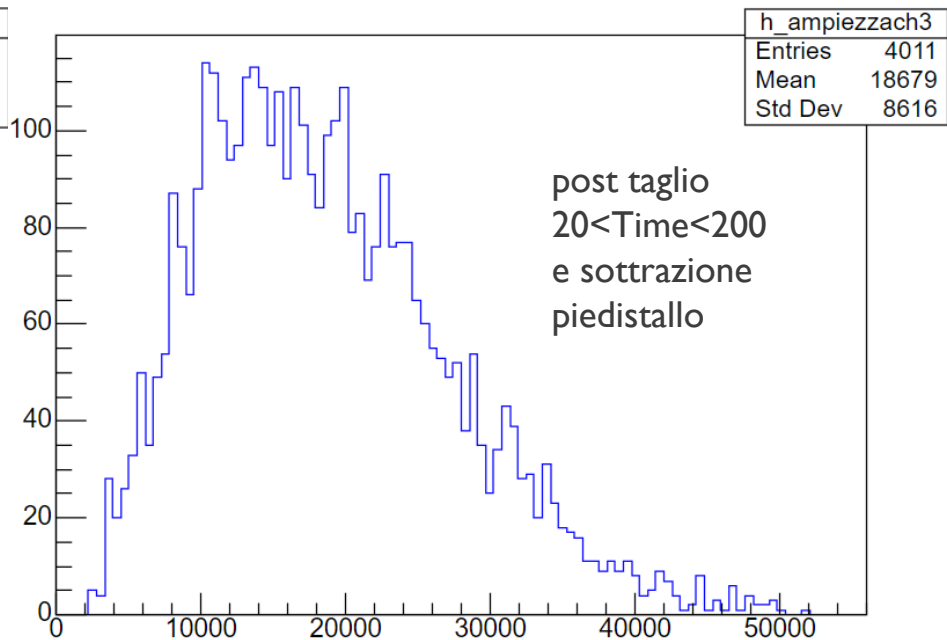


Calibrazioni sipm 6x6 Gain 28

371 run Integral sipm 6x6 gain 28



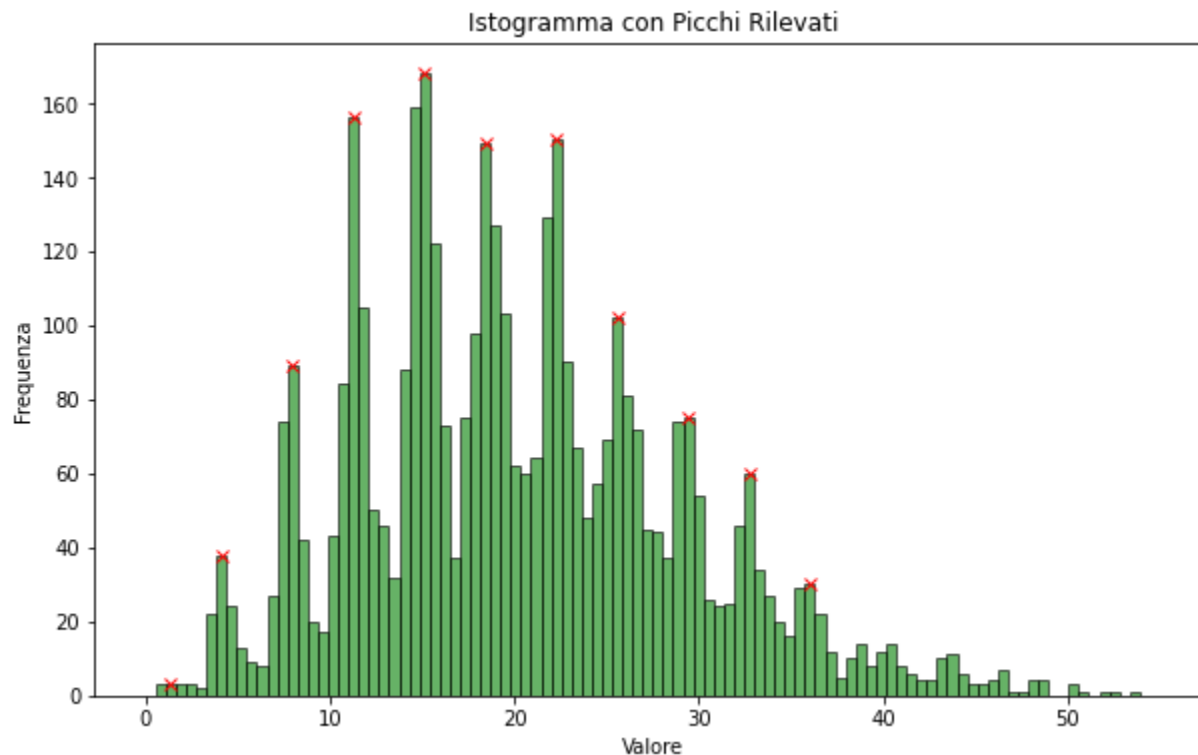
371 run Integral con taglio 20-400 e pedistallo sottratto sipm 6x6 gain 28 filtrato



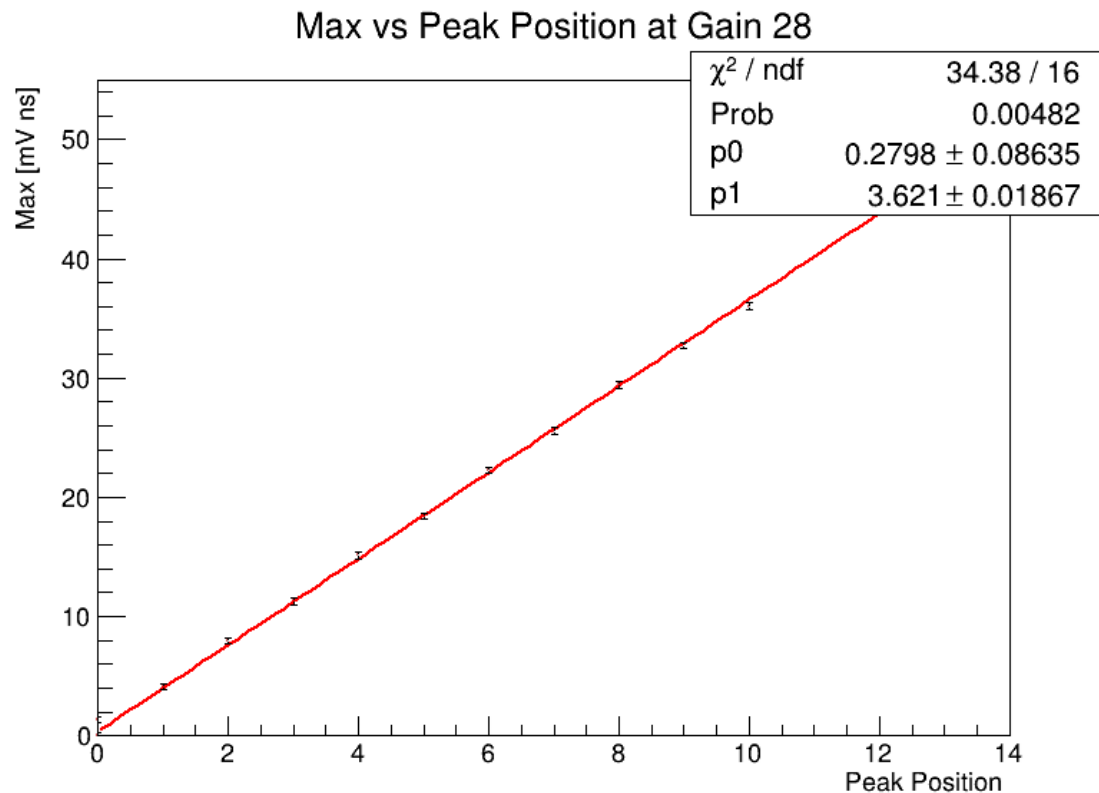
Con gli integrali non si riesce ad avere una buona definizione dei picchi per questo motivo lavoriamo con le ampiezze

Calibrazioni sipm 6x6 Gain 28

Individuazione dei picchi



Calibrazioni sipm 6x6 Gain 28



Calibrazioni sipm 6x6 Gain 28

Per avere la conversione in carica, facciamo il fit della coda della nostra waveform.

Dal fit di $e^{-\frac{x}{\tau}}$ ricaviamo il τ .

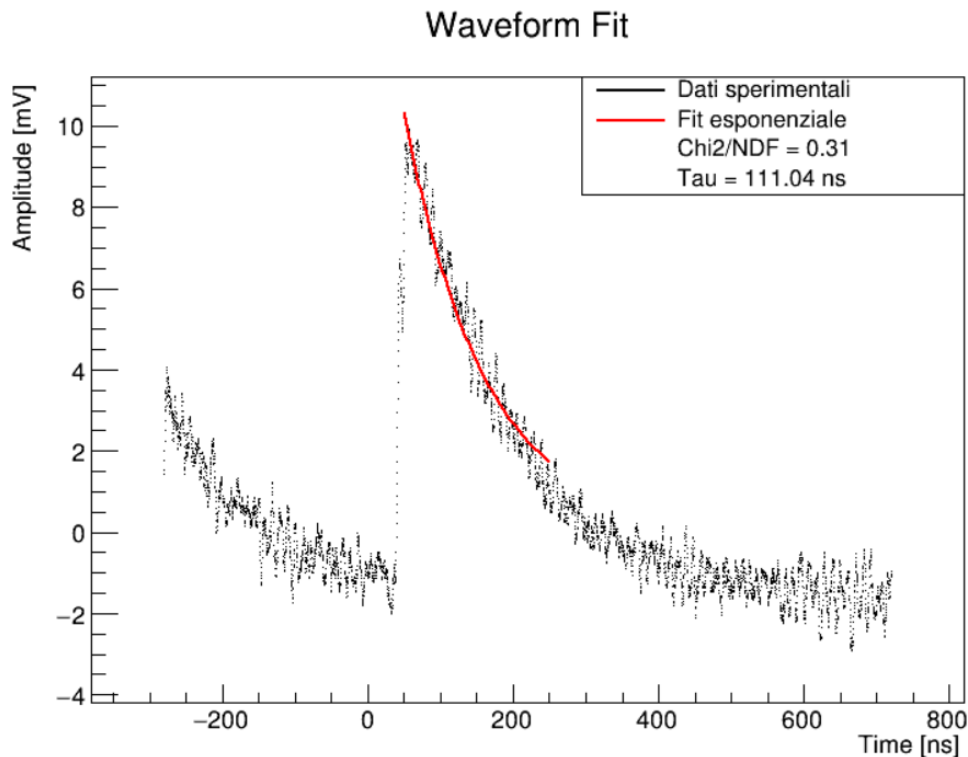
Prendendo come funzione:

$$f(x) = A e^{-\frac{x}{\tau}}$$

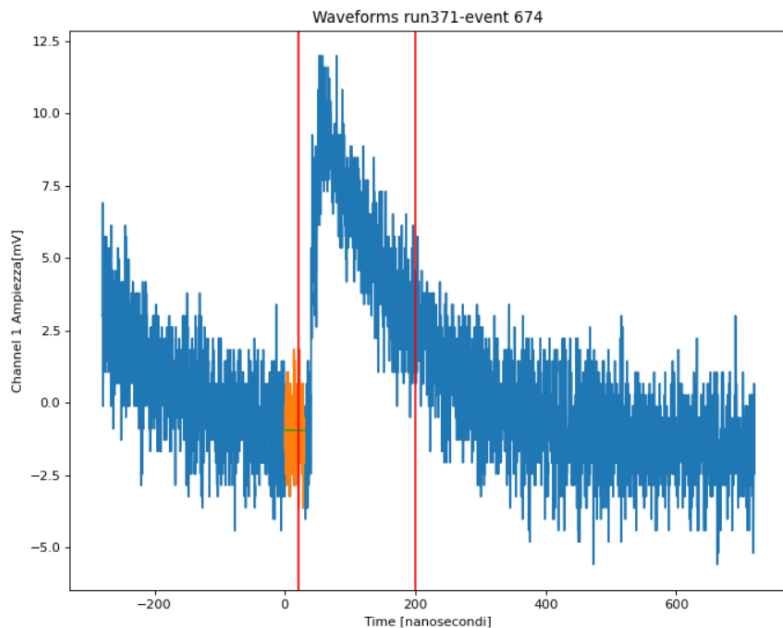
E andando a fare l'integrale

$$\int_0^{3\tau} f(x) dx = A\tau(1 - e^{-3})$$

Ricaviamo così il fattore che ci serve per passare da ampiezza a carica

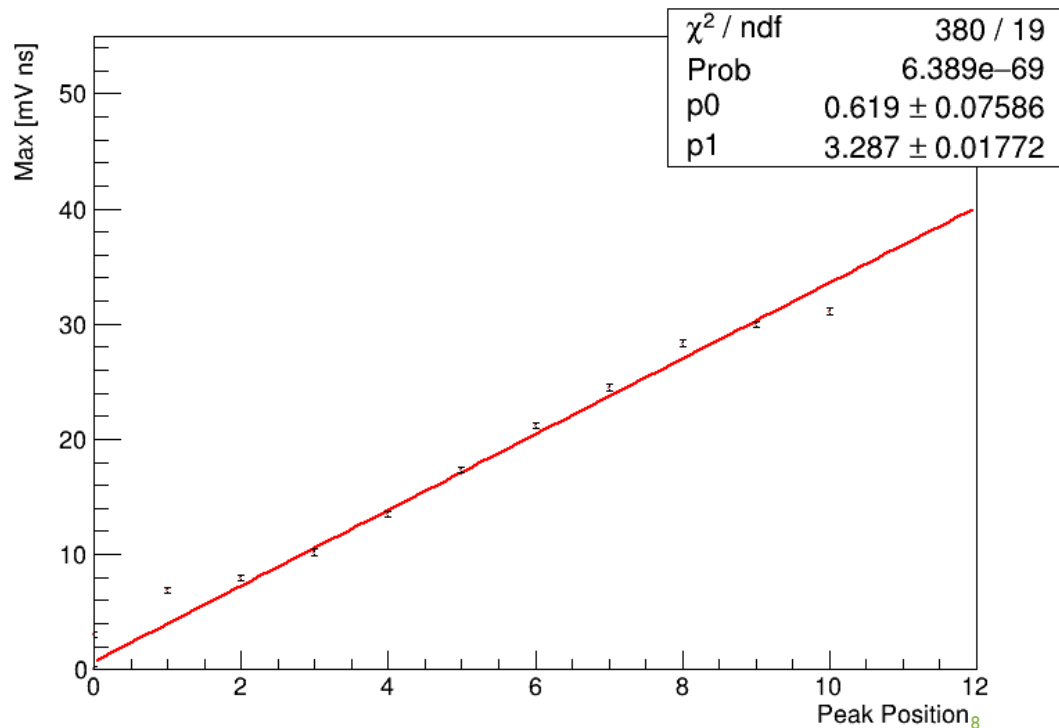


Calibrazioni sipm 6x6 Gain 28 con wf non filtrata



Update Test beam 16/10/2024 Lucrezia Borriello

Max vs Peak Position at Gain 28



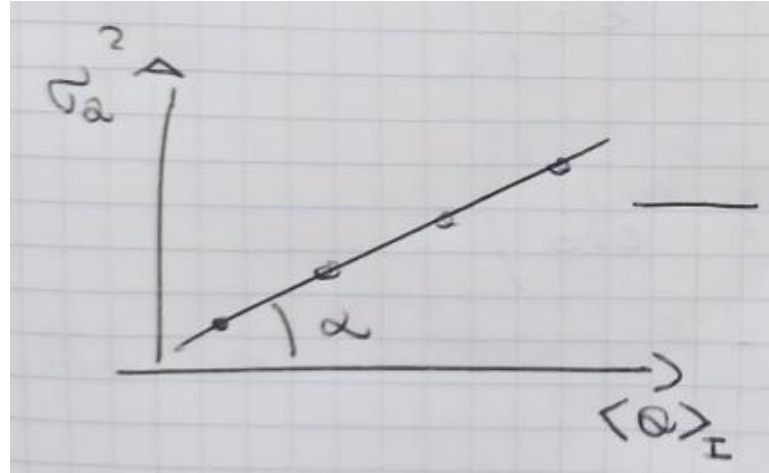
Calibrazioni sipm 6x6 Gain 28 con altro metodo

Altro metodo è quello di basarsi sull'ipotesi che il n_{pe} segue una statistica poissoniana quindi abbiamo che:

$$A = \alpha n_{pe} \quad \langle A \rangle = \alpha \langle n_{pe} \rangle = \alpha \mu$$

$$\sigma_A = \alpha \sigma_{pe} = \alpha \sqrt{\mu} = \sqrt{\alpha} \sqrt{\langle A \rangle}$$

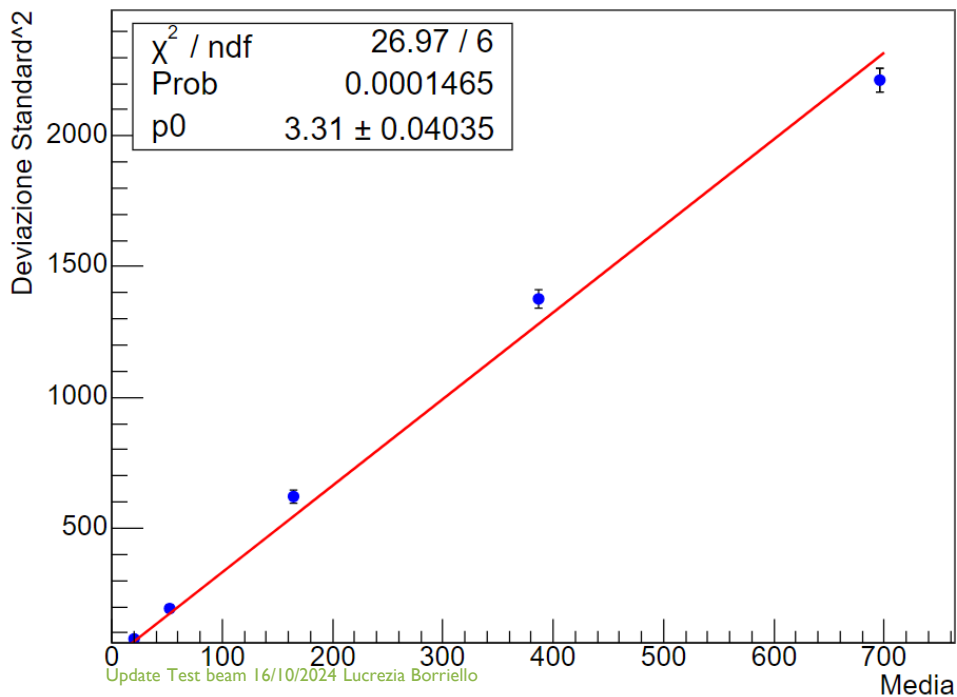
$$\frac{\sigma_A^2}{\langle A \rangle} = \alpha$$



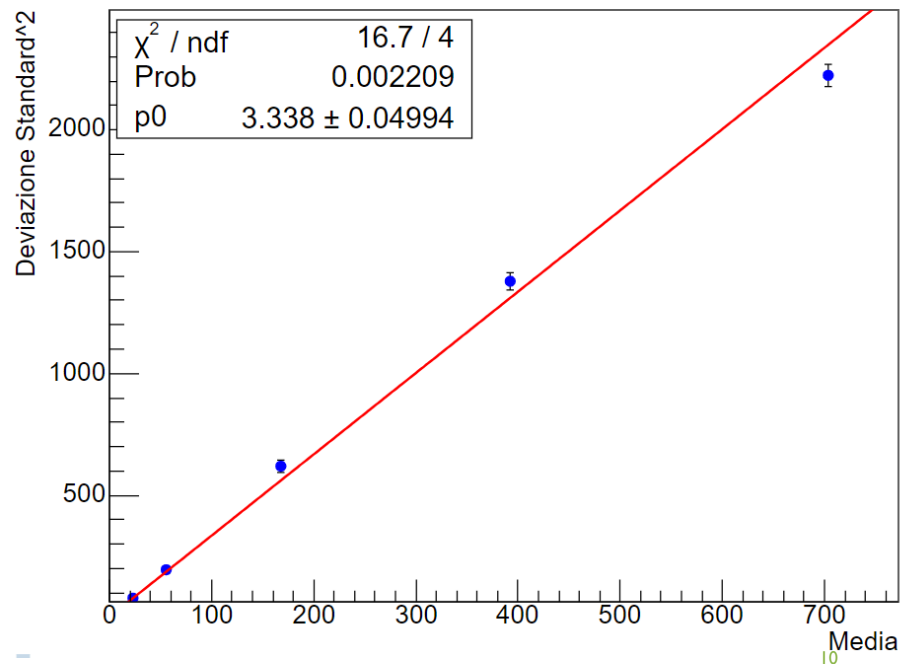
Qui vengono presi i punti a diversa potenza del led

Calibrazioni sipm 6x6 Gain 28 con altro metodo

Deviazione Standard² su Media wf filtrata

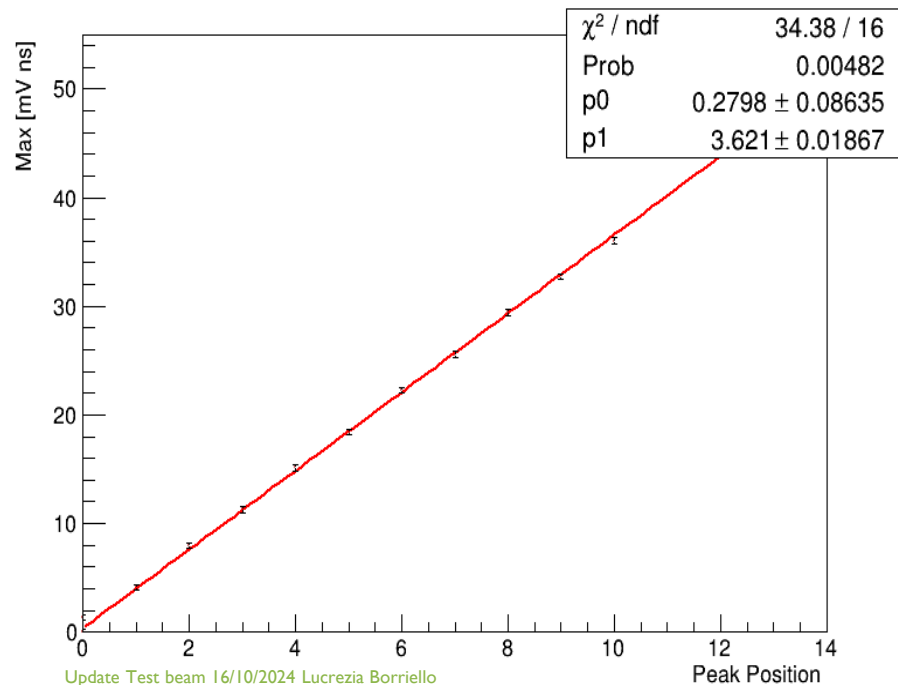


Deviazione Standard² su Media wf NON filtrata

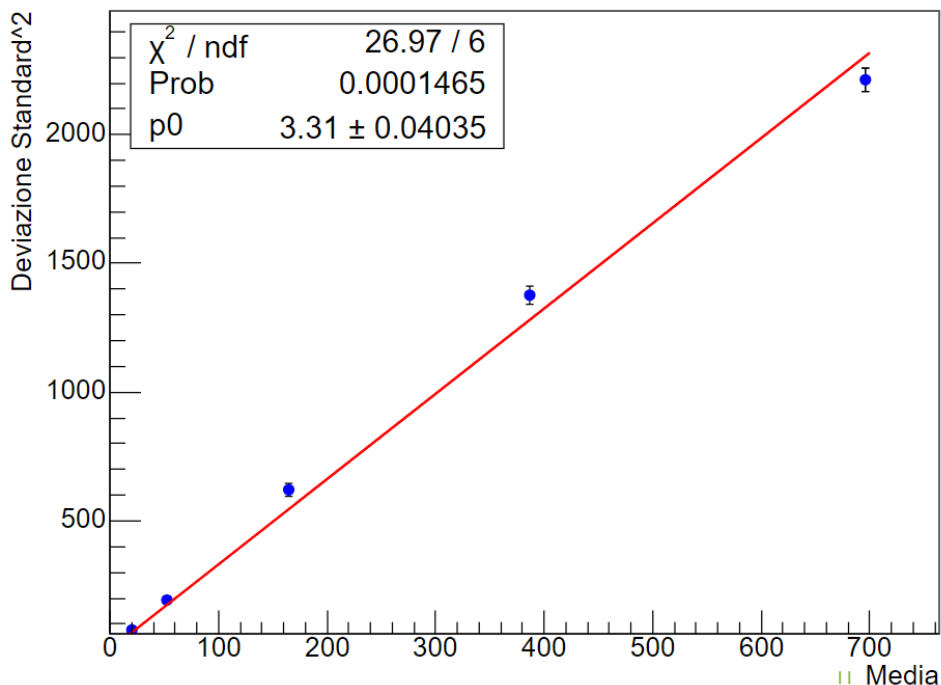


Confronto 2 metodi

Max vs Peak Position at Gain 28

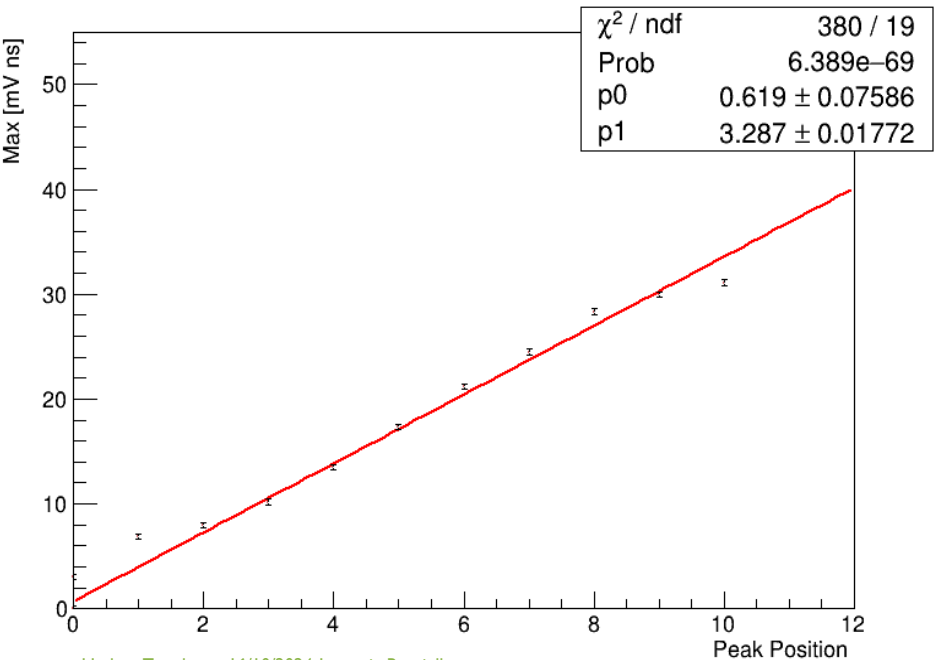


Deviazione Standard² su Media wf filtrata



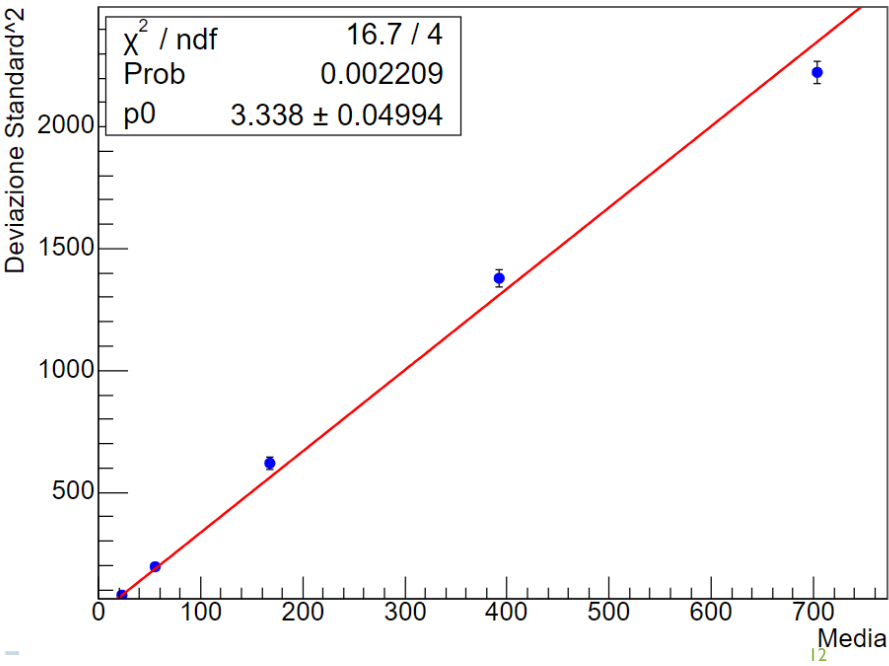
Confronto 2 metodi

Max vs Peak Position at Gain 28



Update Test beam 16/10/2024 Lucrezia Borriello

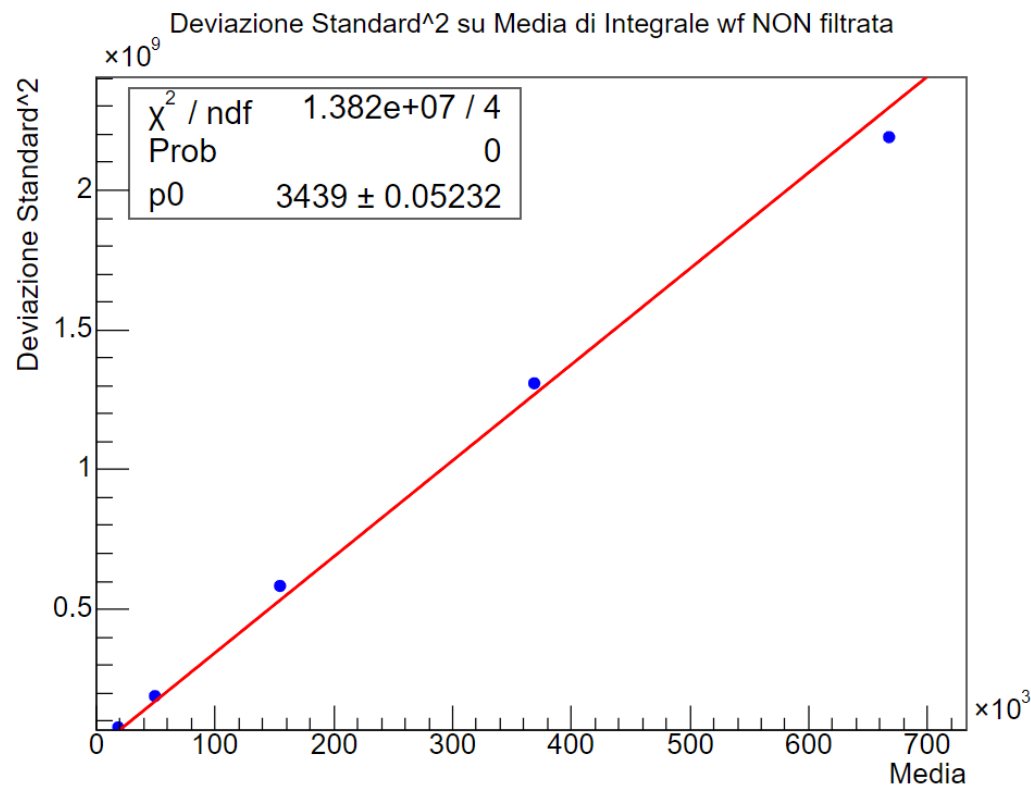
Deviazione Standard^2 su Media wf NON filtrata



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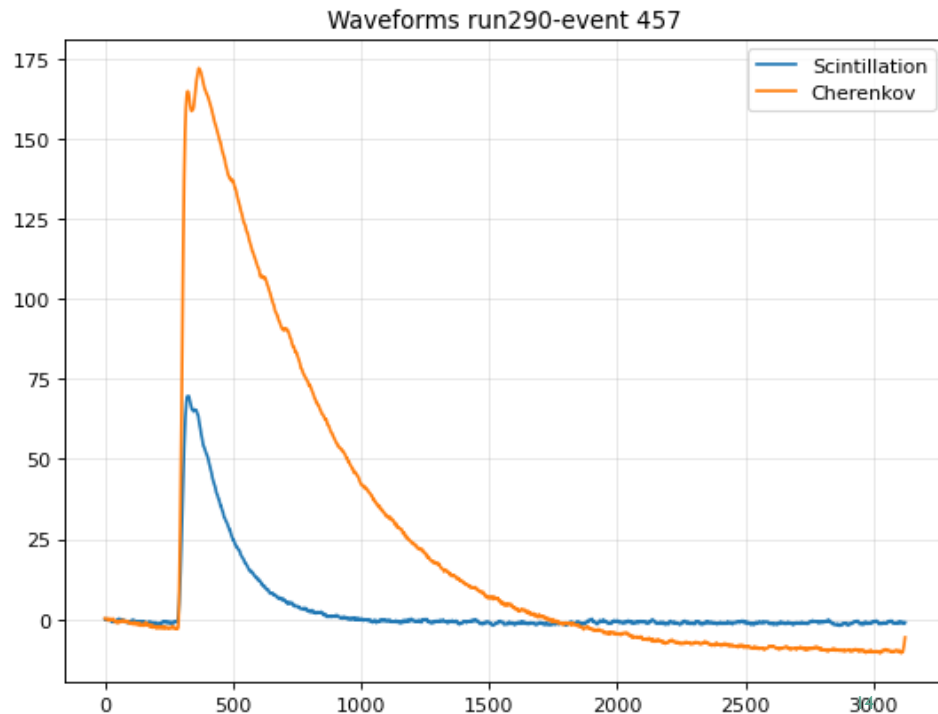
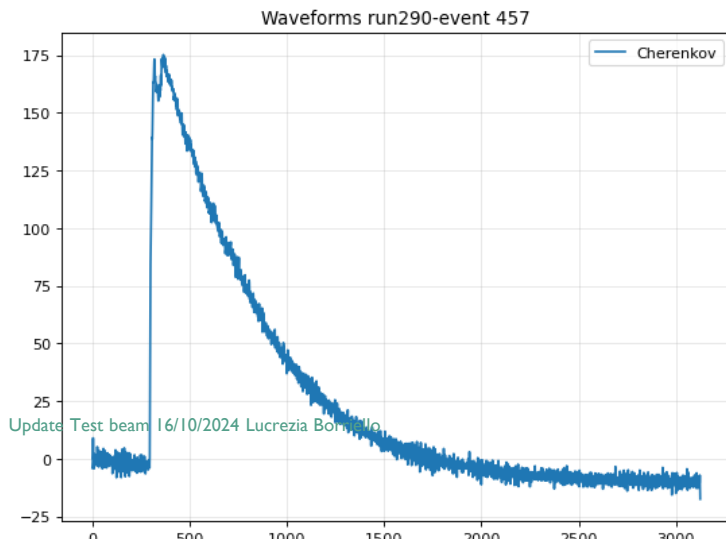
Calibrazioni sipm 6x6 Gain 28 con altro metodo

Metodo applicato
all'integrale:

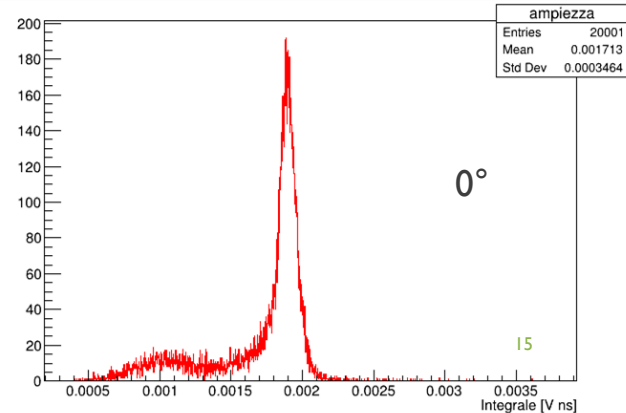
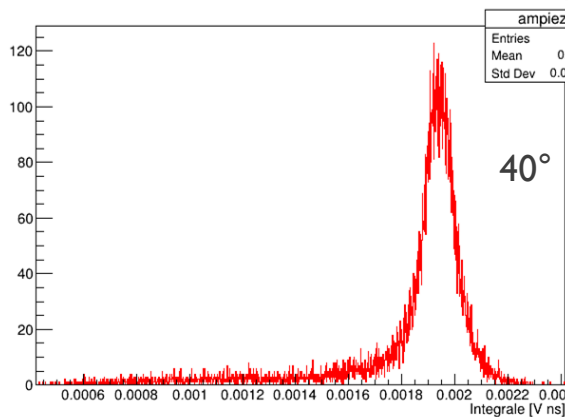
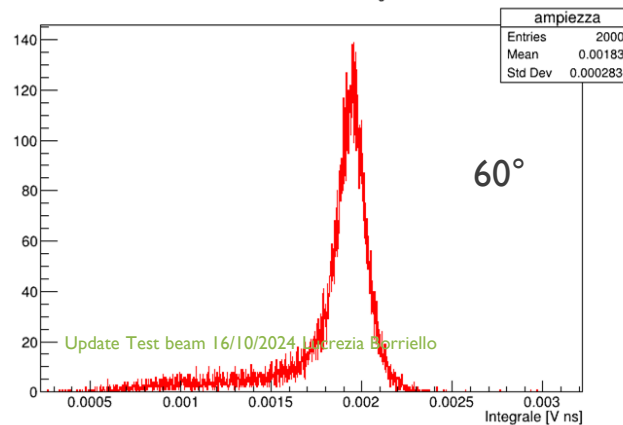
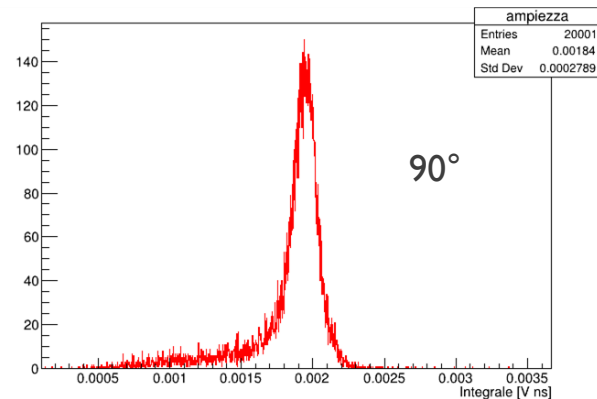
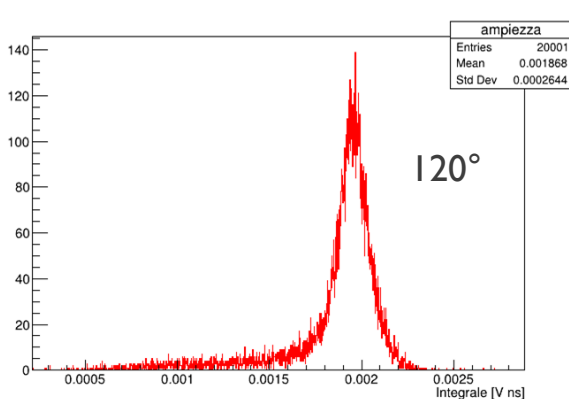
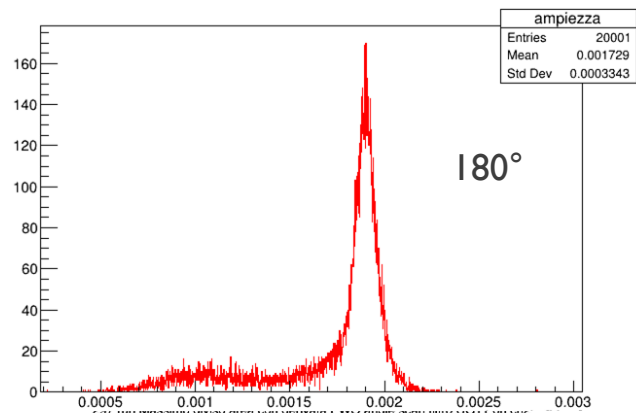


- **Analisi dei run 286-301 PWO scan angolare con e⁺ 10GeV (Manca il run292)**

- Ch1 CAEN amp 28
- CH2 CAEN amp 28 e Filtro 665nm
- CH3 LYSO
- CH4 MPC
- CH5 Plastico 1x1x1 cm³
- CH6 Trigger signal (from MIB plastic)

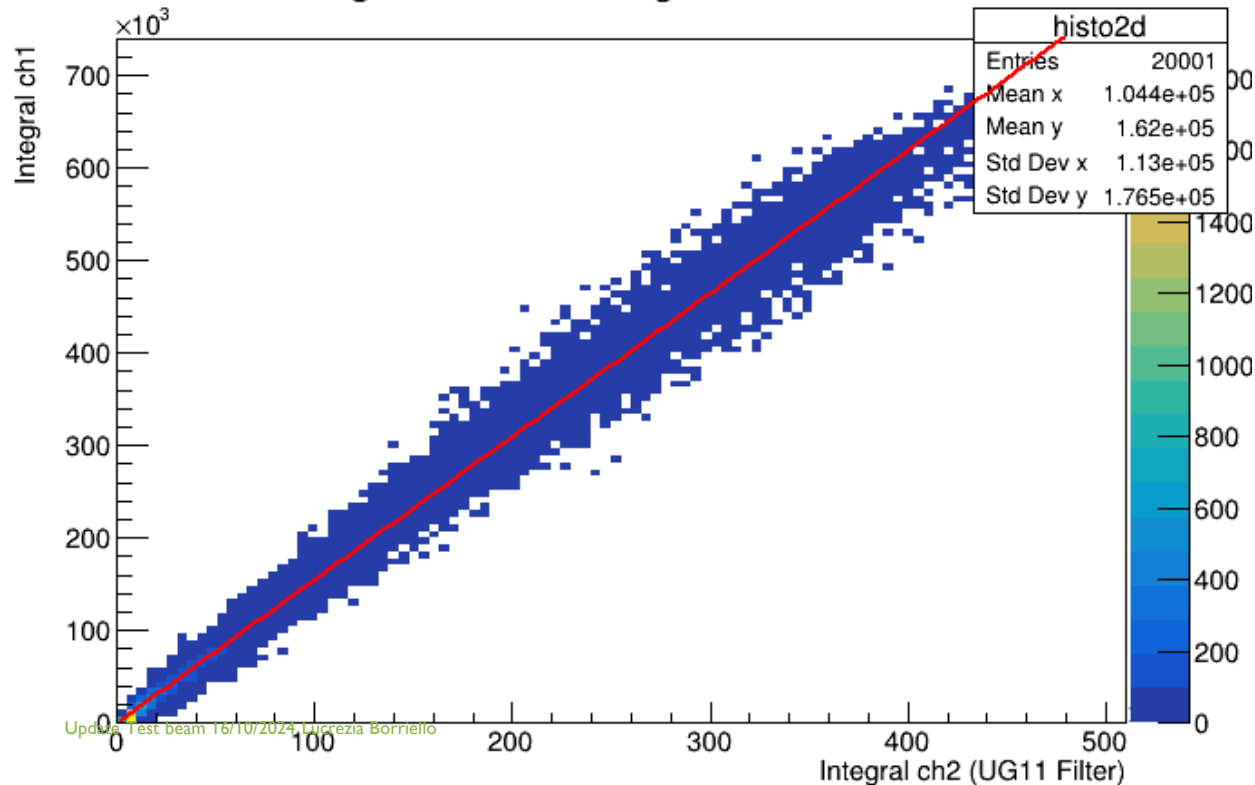


Variable Peak over Area con la derivata of the cherenkov channel



2D Histogram and fit

Integrale ch2 vs integrale ch1 run278



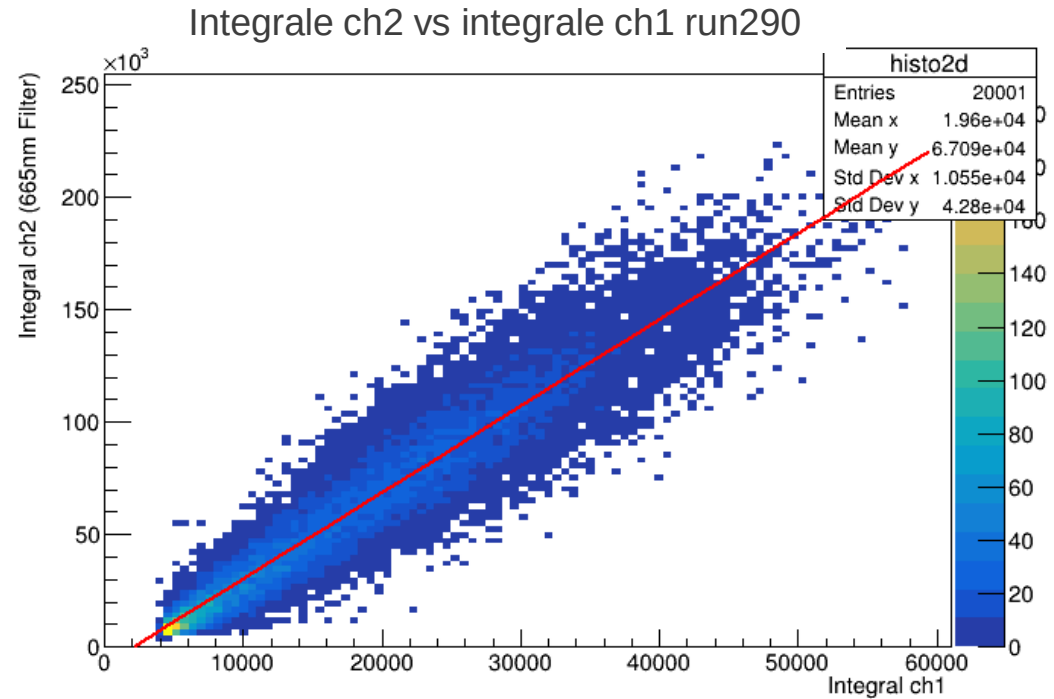
- Se ci fosse solo scintillazione la pendenza sarebbe sempre uguale in funzione dell'angolo

run	Angle °	p0±error	p1±error
264	180	19.6172 ±38	1.367 ± 0.001
265	160	-24.5257 ± 37	1.333 ± 0.001
266	140	365.233 ± 33	1.144 ± 0.001
267	130	419.05 ± 31	1.089 ± 0.001
268	120	457.988 ± 30	1.071 ± 0.001
269	110	662.832 ±30	1.078 ± 0.001
270	100	167.5 ±32	1.171 ± 0.002
271	90	298.584±32	1.239±0.002

2D Histogram and fit for PWO e+10GeV

- Se ci fosse solo scintillazione la pendenza sarebbe sempre uguale in funzione dell'angolo

run	Angle °	p1±error	run	Angle °	p1±error
286	180	2.893±0.003	295	80	2.703±0.006
287	160	2.973±0.004	296	70	2.490±0.006
288	140	3.621±0.006	297	60	2.465± 0.005
289	130	3.746±0.006	298	50	2.438±0.005
290	120	3.848± 0.007	299	40	2.544±0.004
291	110	3.811±0.008	300	20	2.507±0.002
293	100	3.562±0.008	301	0	2.626±0.003
294	90	3.202± 0.007			



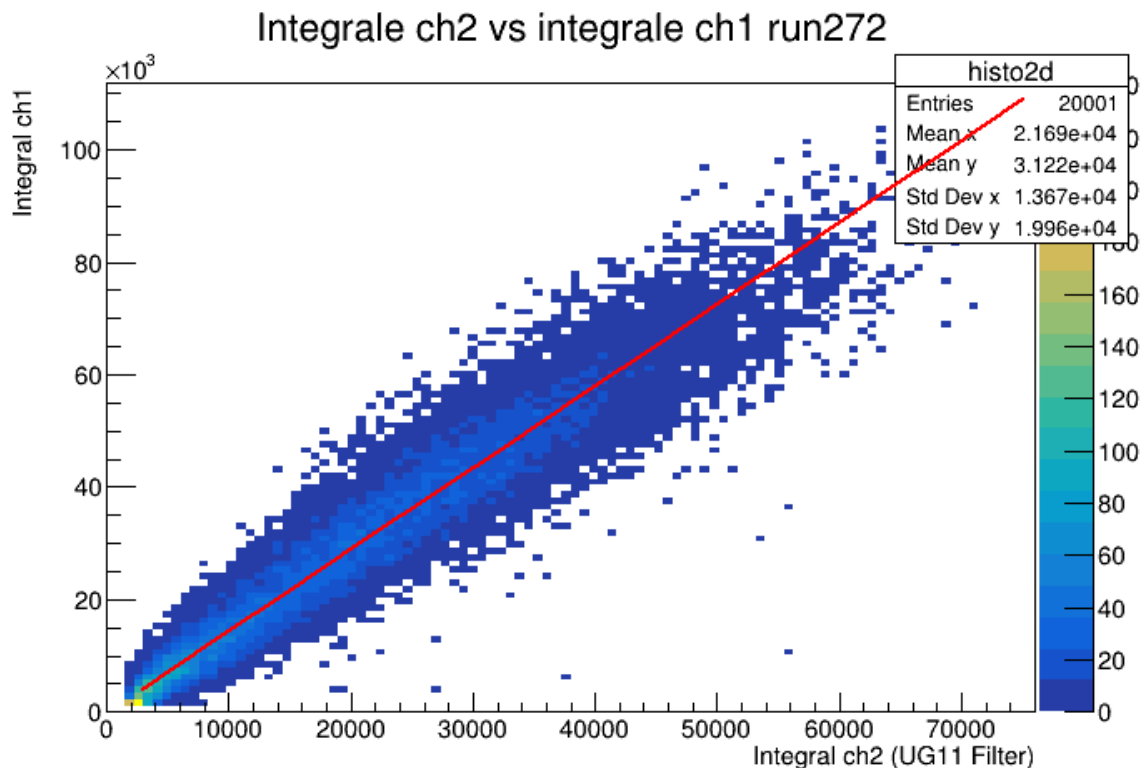
Prossimi step

Analisi:

- Vorrei esaminare gli eventi che si discostano dalla diagonale dell'istogramma 2D e vedere le waveform di quegli eventi
- Continuare a lavorare e migliorare lo studio con la variabile Peak over Area

Calibrazione:

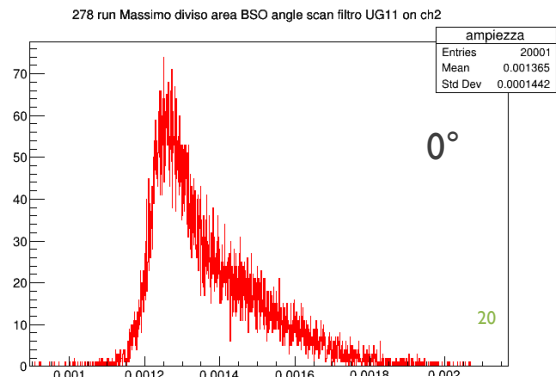
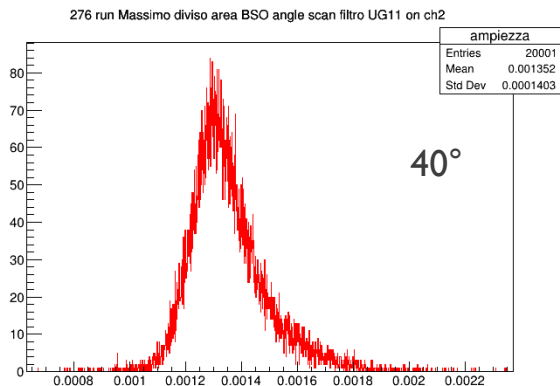
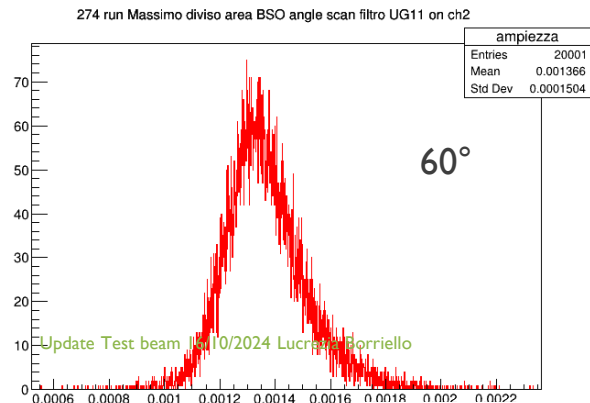
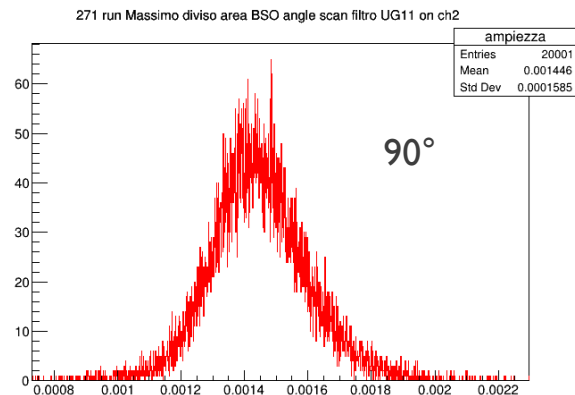
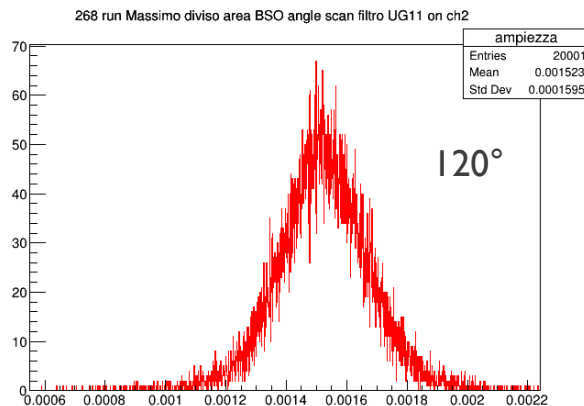
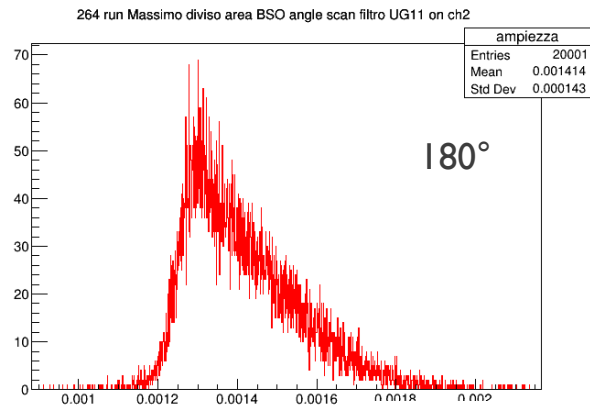
- Calibrare sipm 6x6 a gain 18
- Calibrare sipm 3x3 a gain 18 e 28





Backup Slides

Peak over Area of the cherenkov channel



Stato del setup in hangar

- manca filo per alimentare i preamplificatori

