

Studi di fattibilità al Vesuvio

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Istituto Nazionale di Fisica Nucleare



Sommario



Studio di fattibilità a differenti quote:

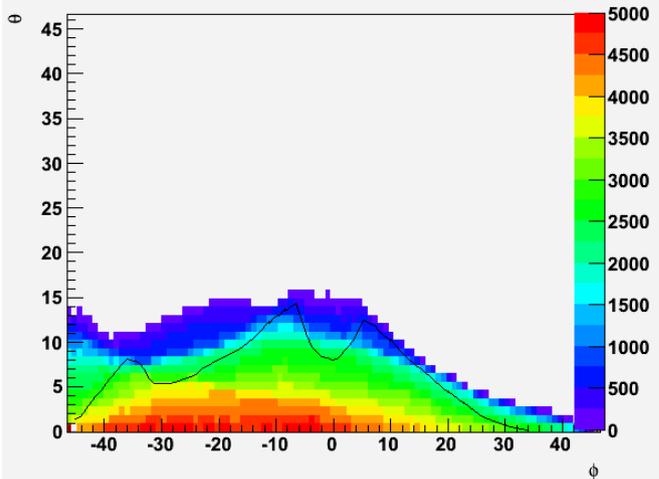
- Posizioni a "bassa" quota < 700 m
- Posizioni a quota "media" [750 m , 800 m]
- Posizioni ad "alta" quota > 950 m

Punti considerati

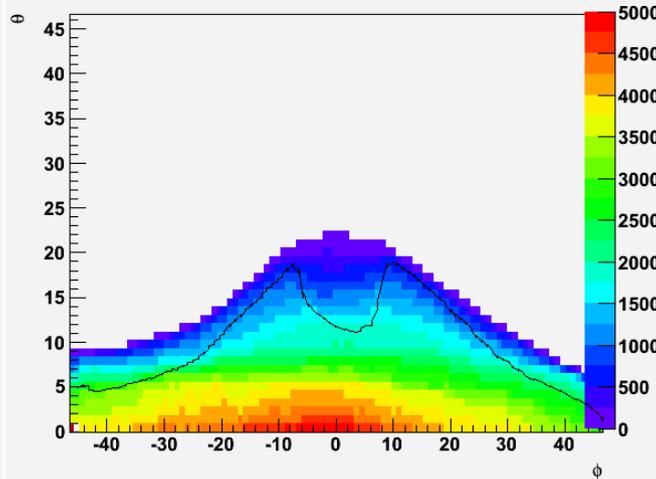


Spessori di roccia

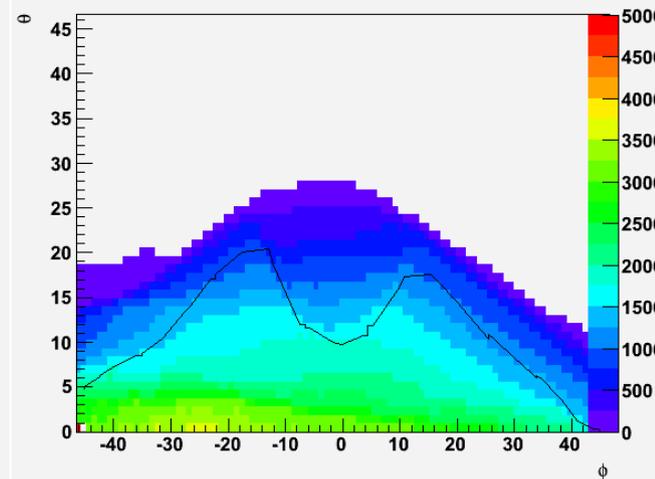
Spessori Osservatorio 615m



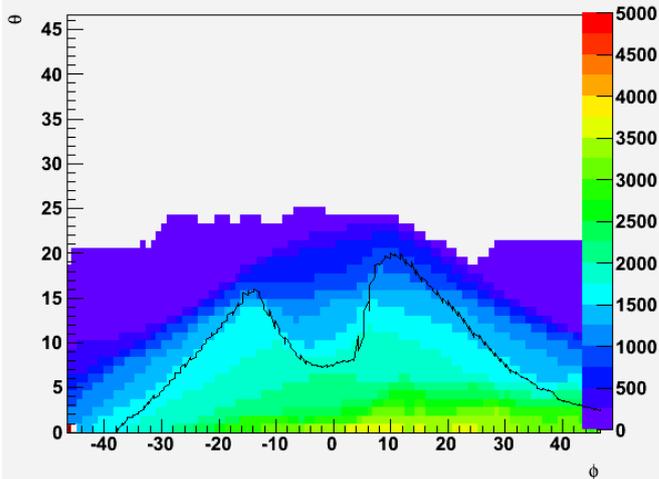
Spessori bacino idrico forestale 600m



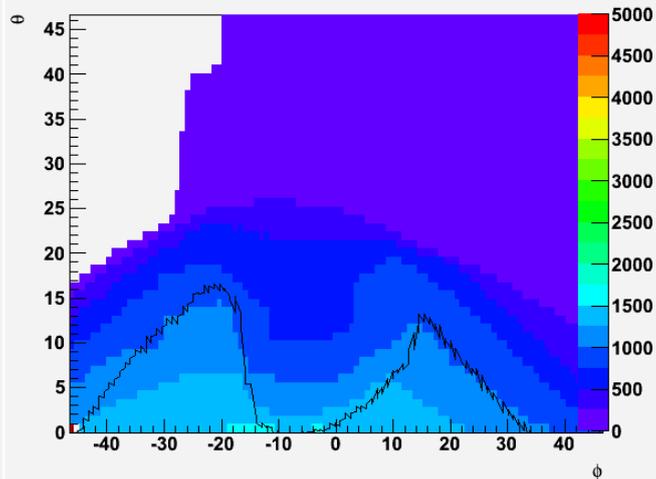
Spessori de Gregorio 760M



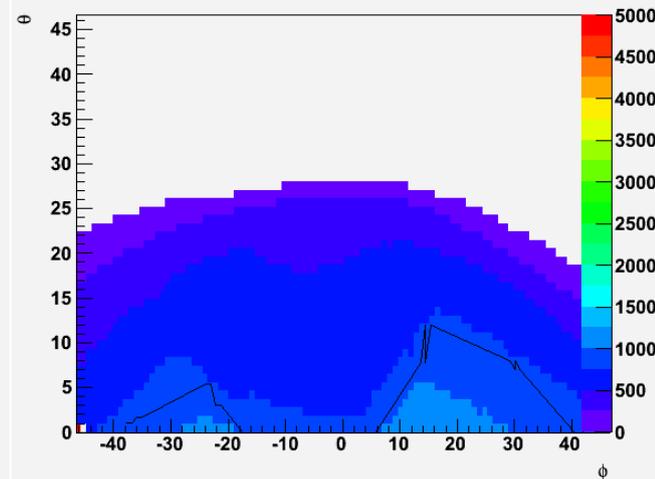
Spessori Strada Matrone 802 m



Spessori Imbo 970M



Spessori Strada Matrone 1057 m

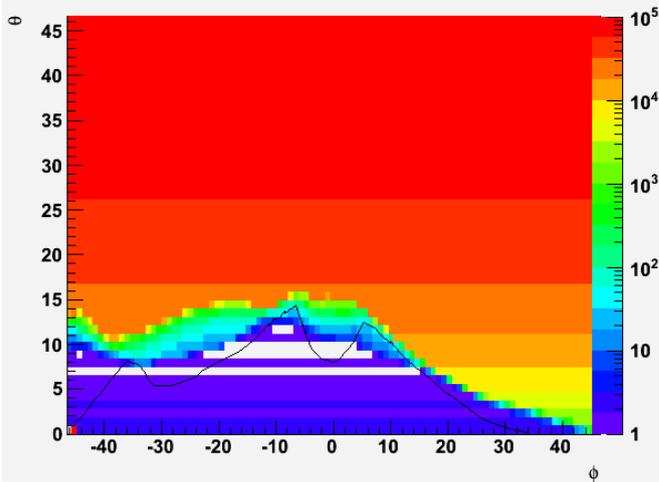


Spessori di roccia del Vesuvio "visti" dal detector nei vari siti.

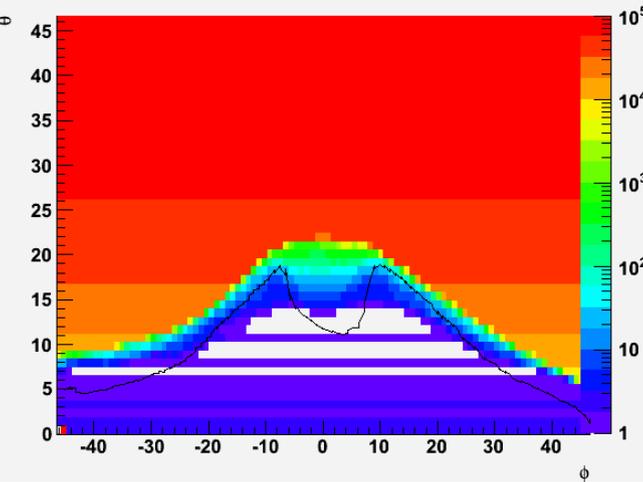
La linea nera è il profilo del Vesuvio su un piano parrallelo al detector e passante per il fondo del cratere .

Flussi attesi

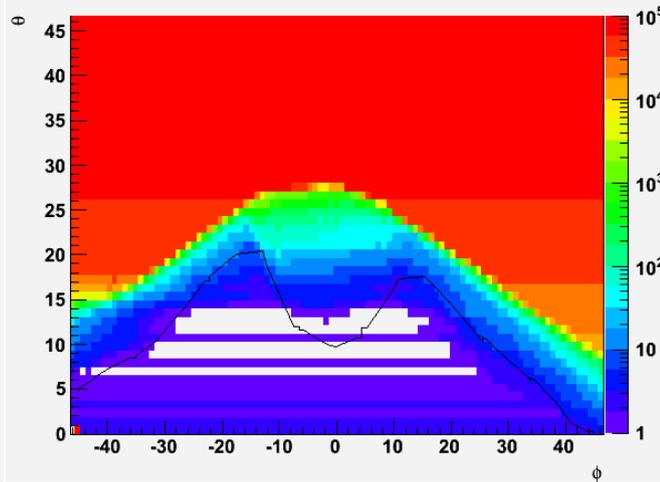
muons 365 gay m². Osservatorio 615 m



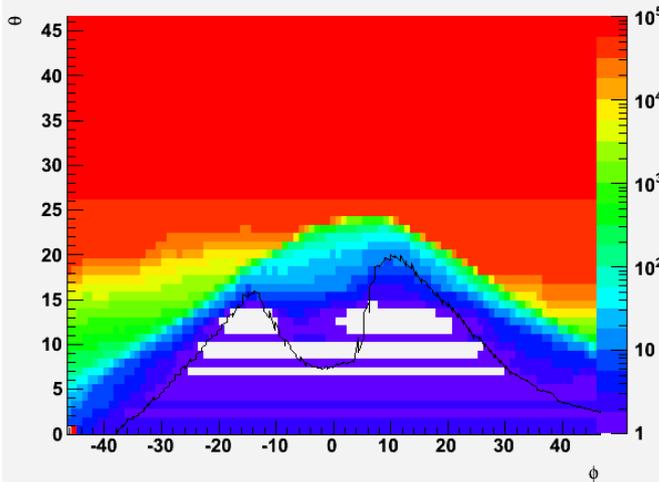
muons 365 gay m². Casine Forestali 600 m



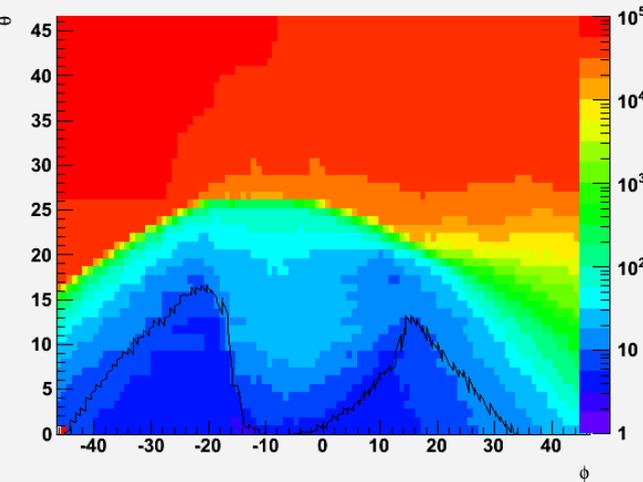
muons 365 gay m². de Gregorio 760 m



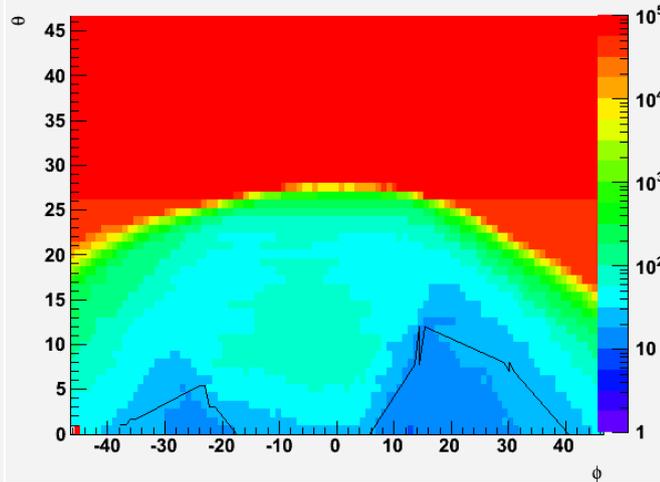
muons 365 gay m². Strada Matrone 870 m



muons 365 gay m². Casina Imbo 970 m



muons 365 gay m². Strada Matrone 1057 m



Flussi attesi sul detector nei vari siti. 1 anno 1 m²

La linea nera è il profilo del Vesuvio su un piano parrallelo al detector e passante per il fondo del cratere .

Simulazione

- Densità media del Vesuvio 2.5 g/cm^3 .
- Variazione densità 10% (??) in piu' rispetto al valore medio.
- Definisco lo stimatore S:

$$S(\theta_x, \theta_y) = \frac{N(\theta_x, \theta_y)(\rho) - N(\theta_x, \theta_y)(\rho + \delta\rho)}{\sqrt{\sigma_{N(\rho)}^2 + \sigma_{N(\rho+\delta\rho)}^2}}$$

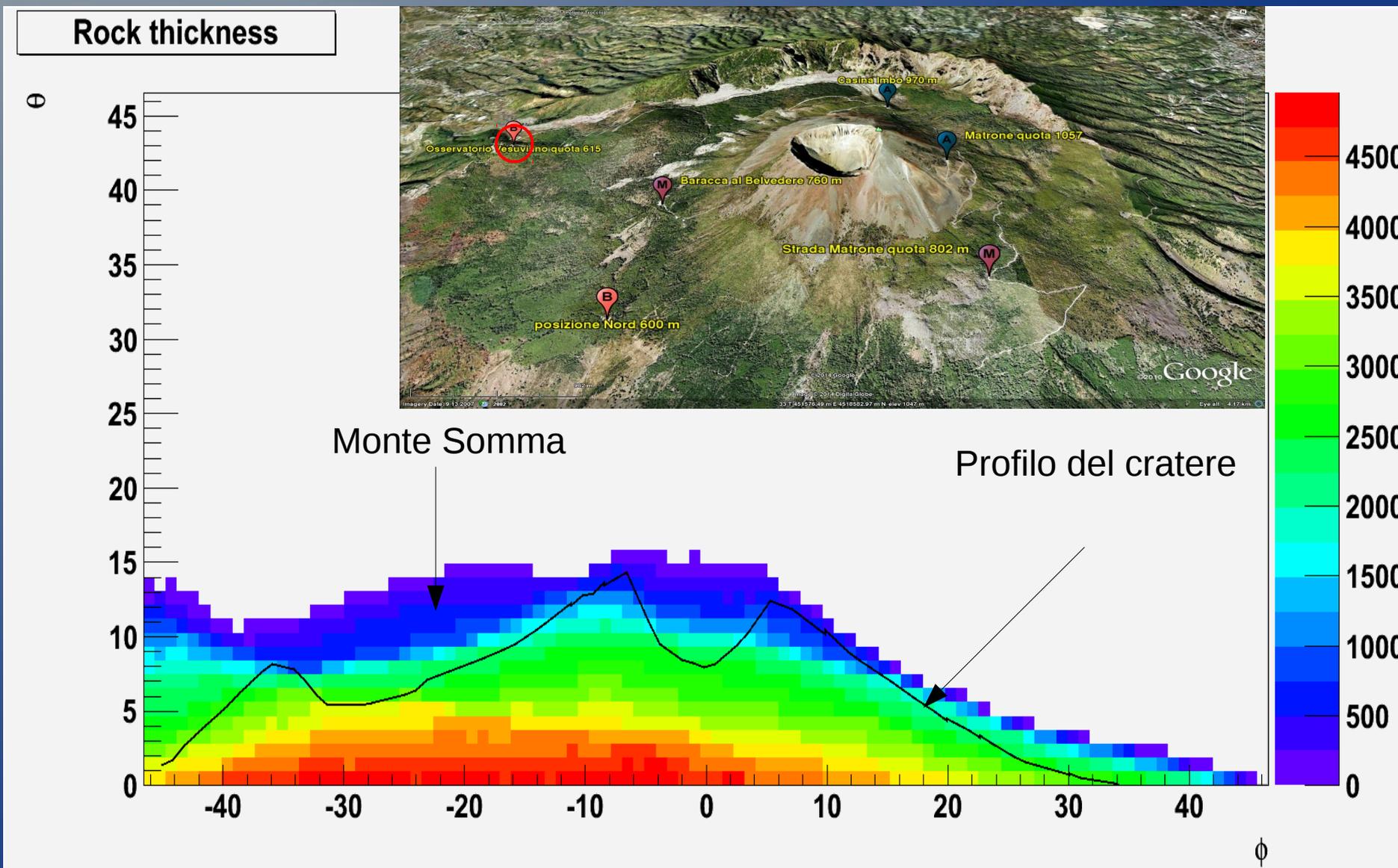
$N(\theta_x, \theta_y)(\rho)$ = Numero di muoni attesi nel bin angolare (θ_x, θ_y) con la densità media ρ



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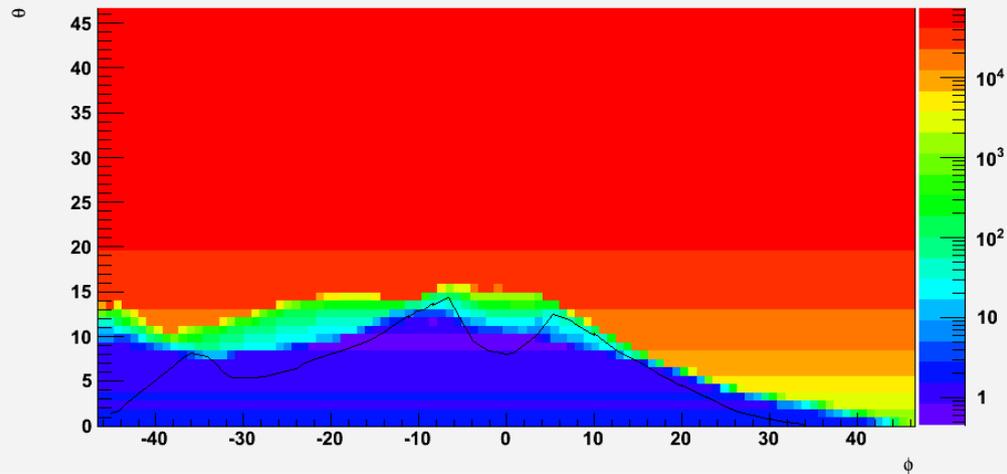
Posizioni a "bassa" quota:
Osservatorio Vesuviano 615 m
Casine Forestale 600 m

Osservatorio Vesuviano quota 615

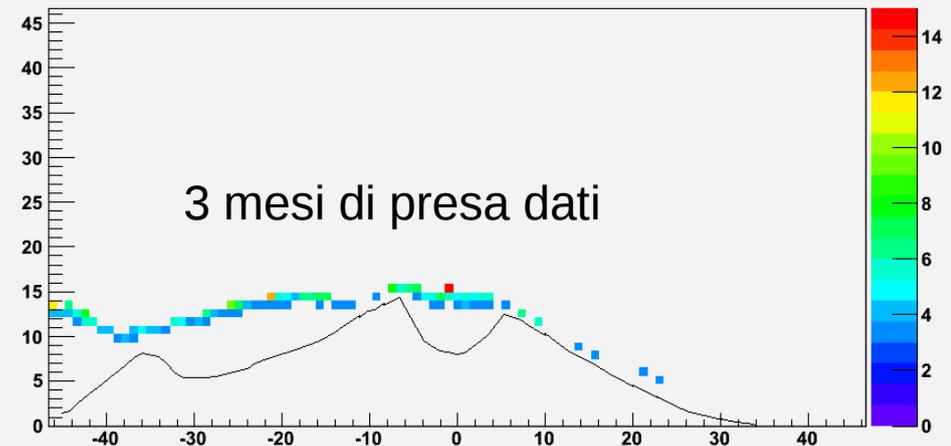


Risoluzione 16 mrad

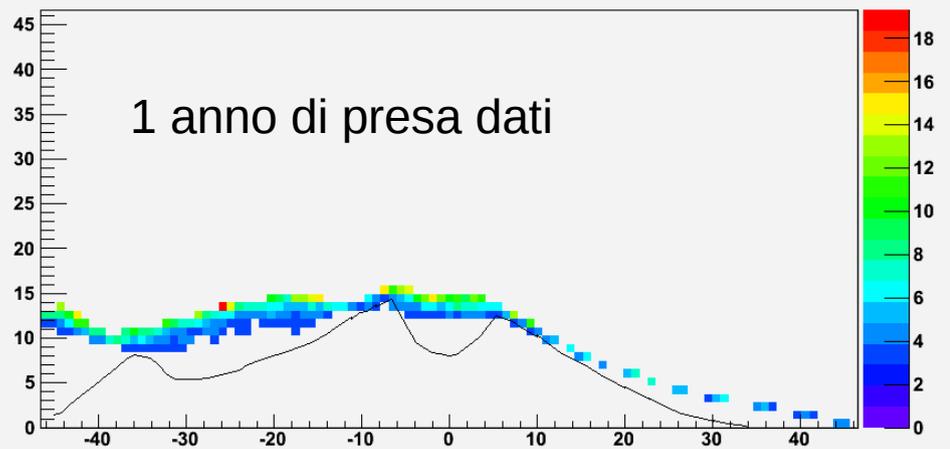
Number of entries (365 days m²)



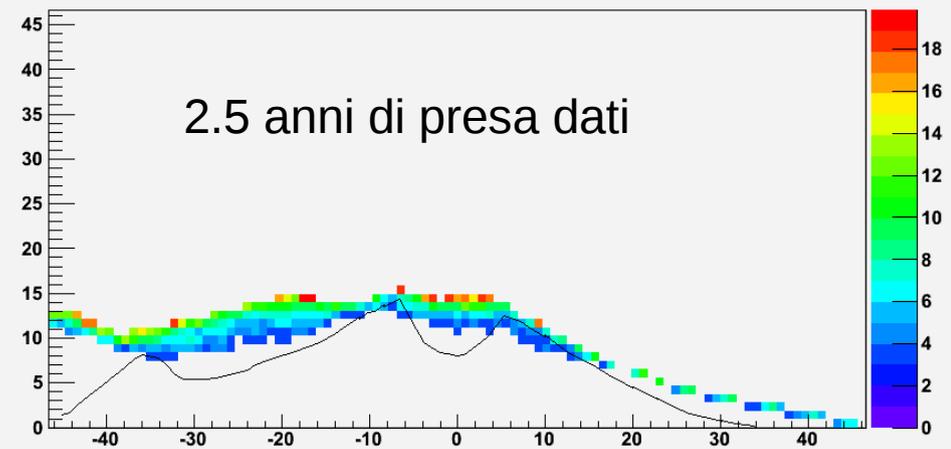
S: 3 mesi



S: 1 anno

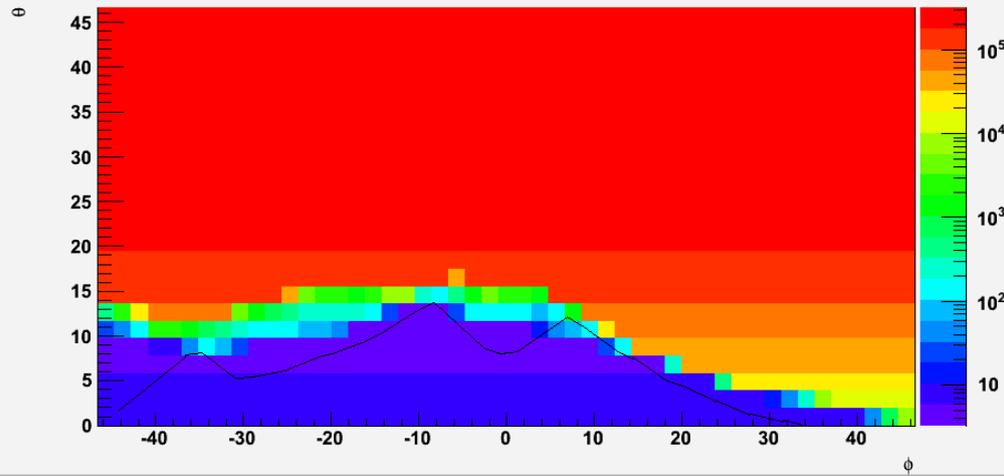


S: 2.5 anni

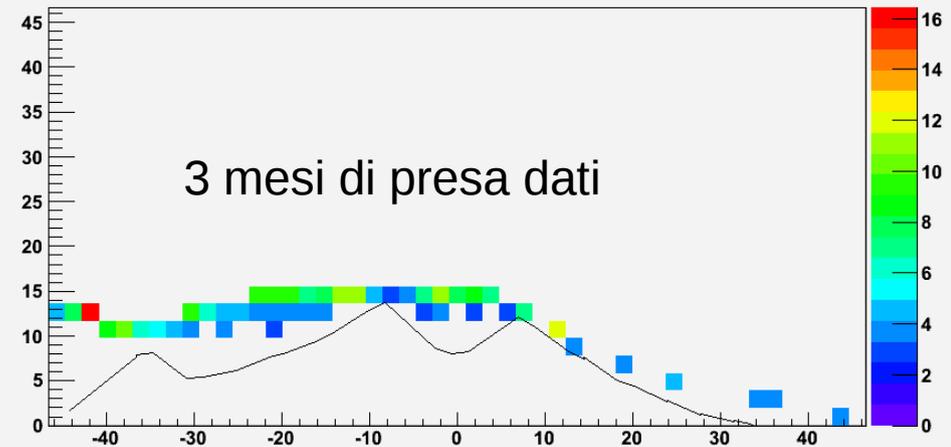


Risoluzione 32 mard

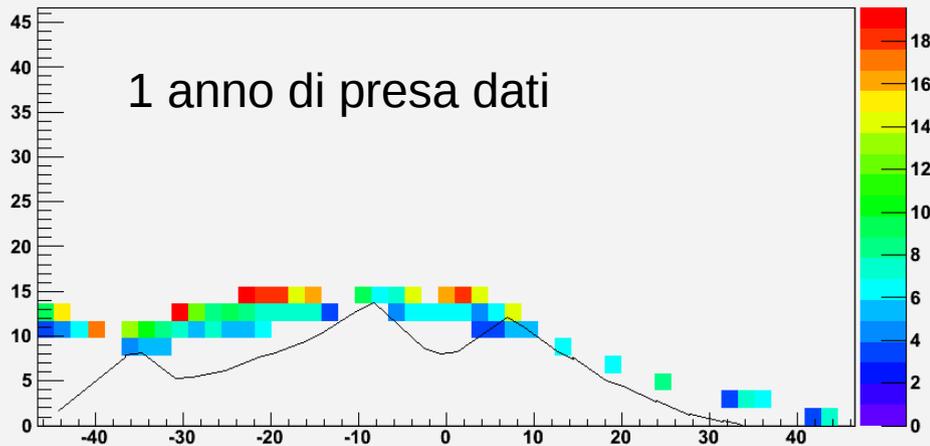
Number of entries (365 days m²)



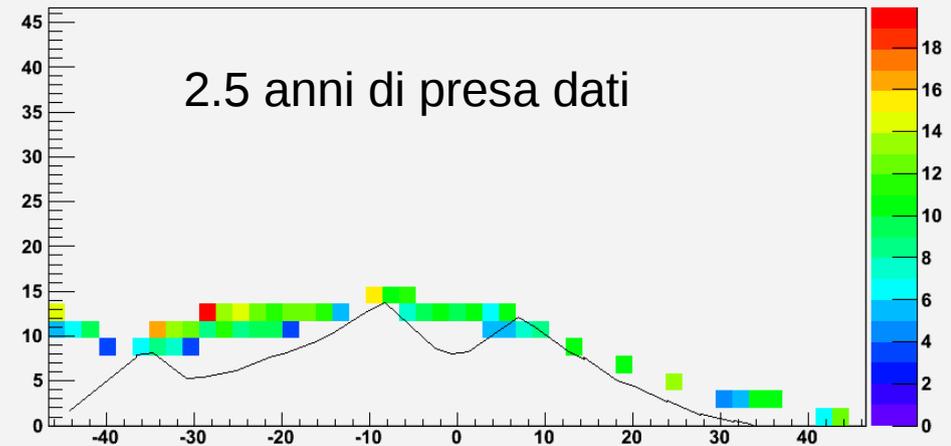
S: 3 mesi



S: 1 anno

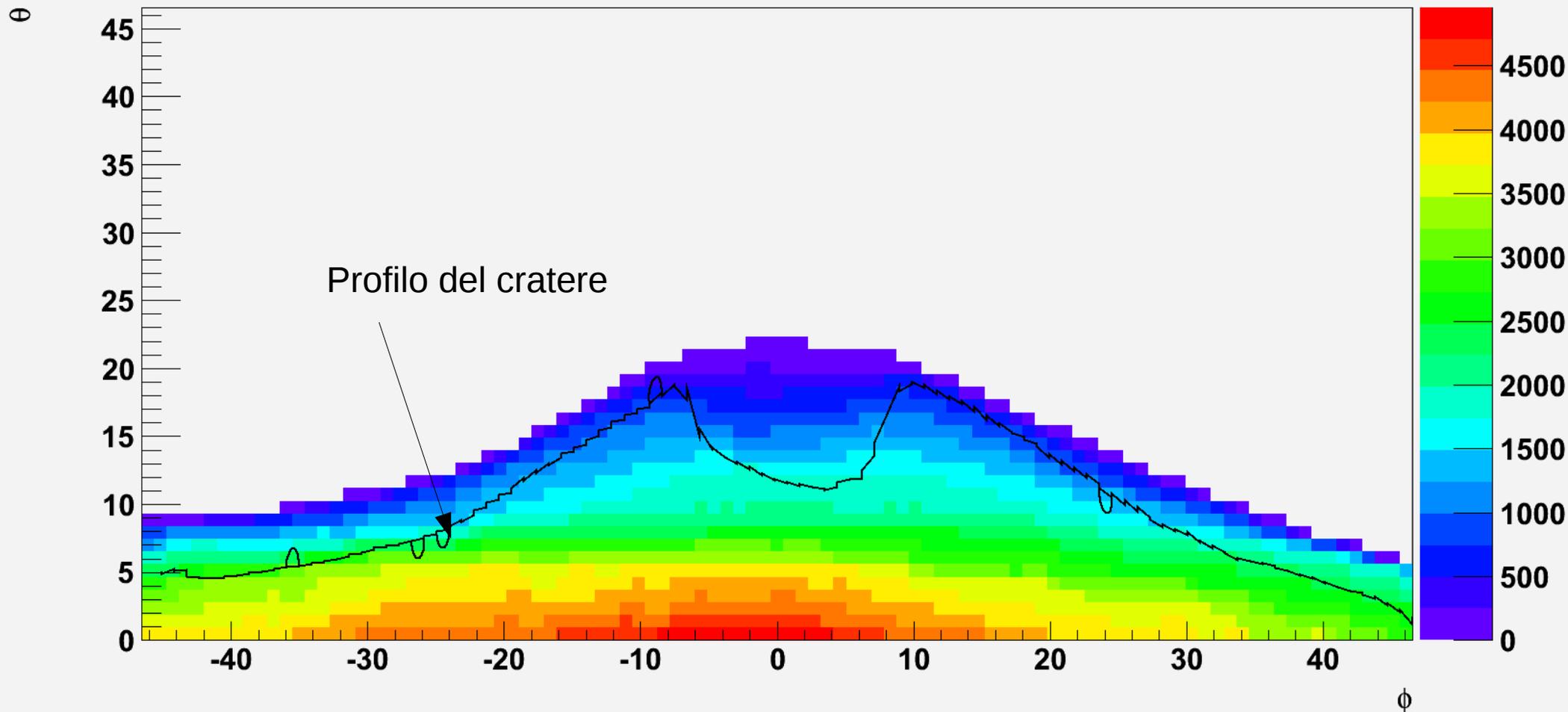


S: 2.5 anni



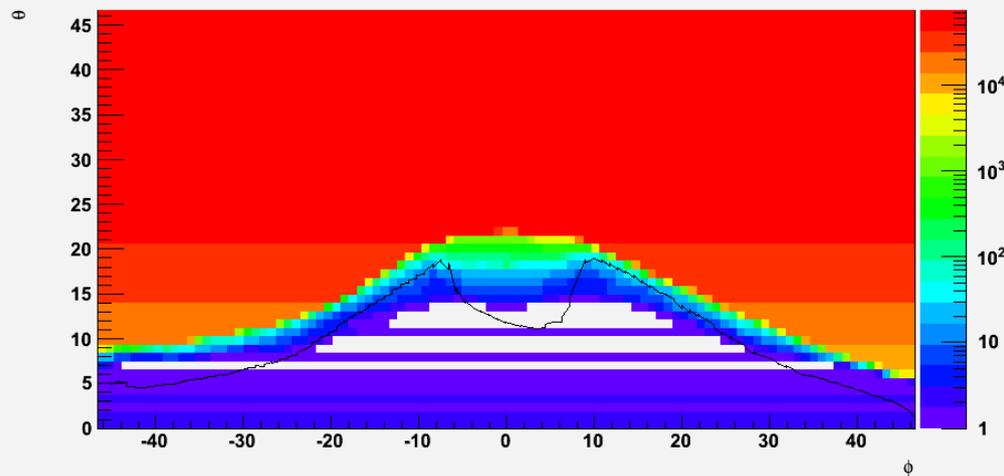
"Casine Forestali" quota 600 m

Rock thickness

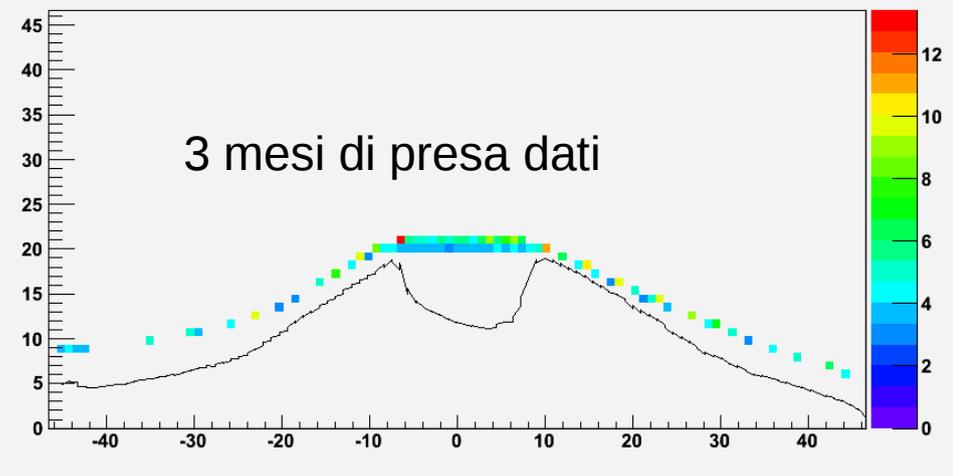


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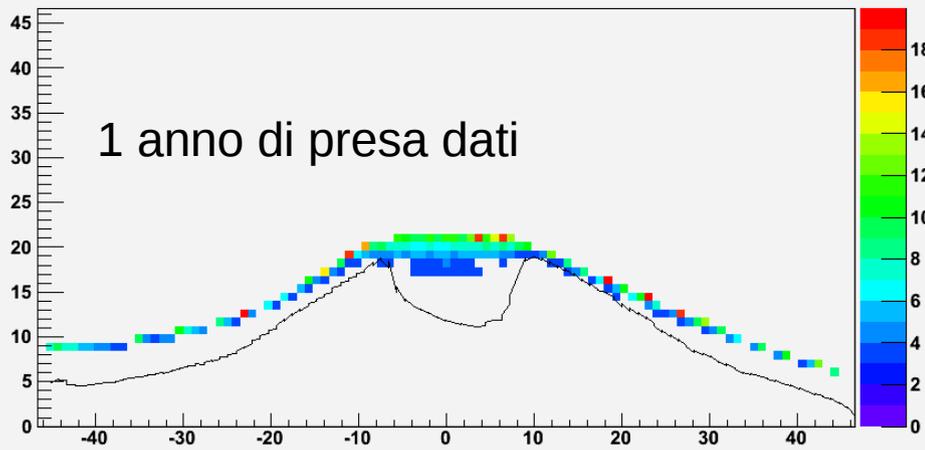
Number of entries (365 days m²)



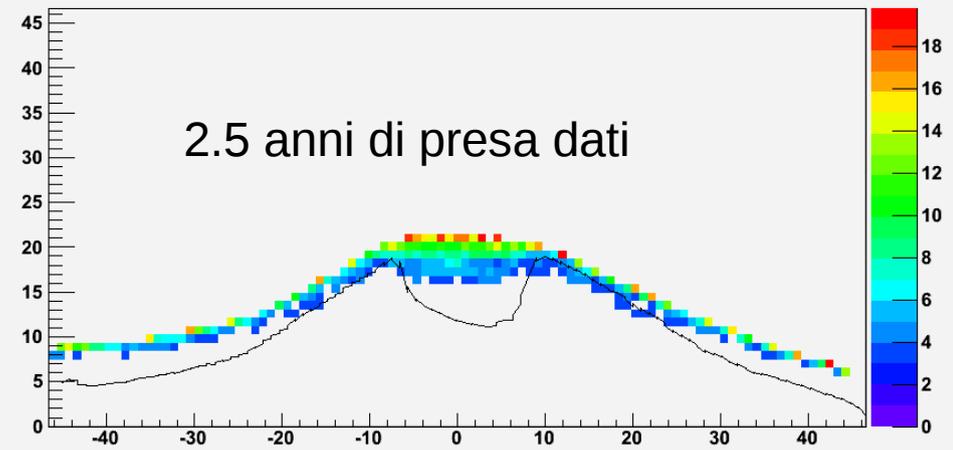
S: 3 mesi



S: 1 anno

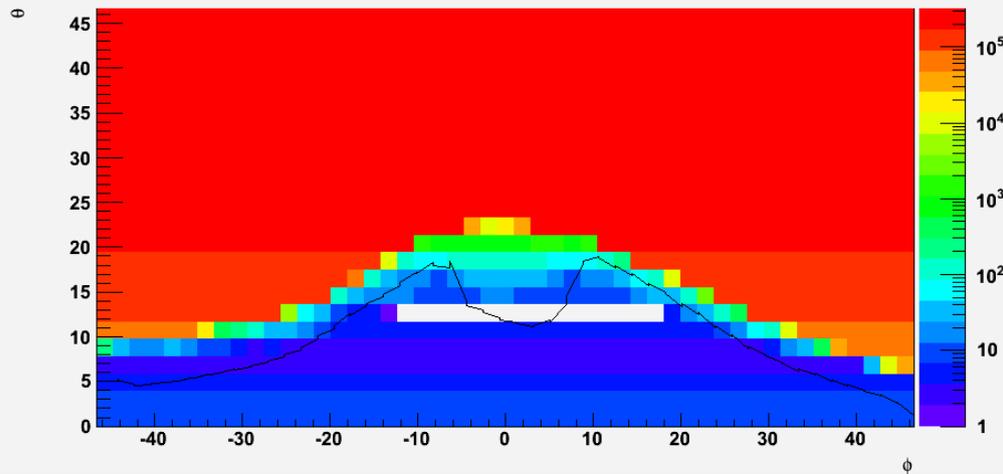


S: 2.5 anni

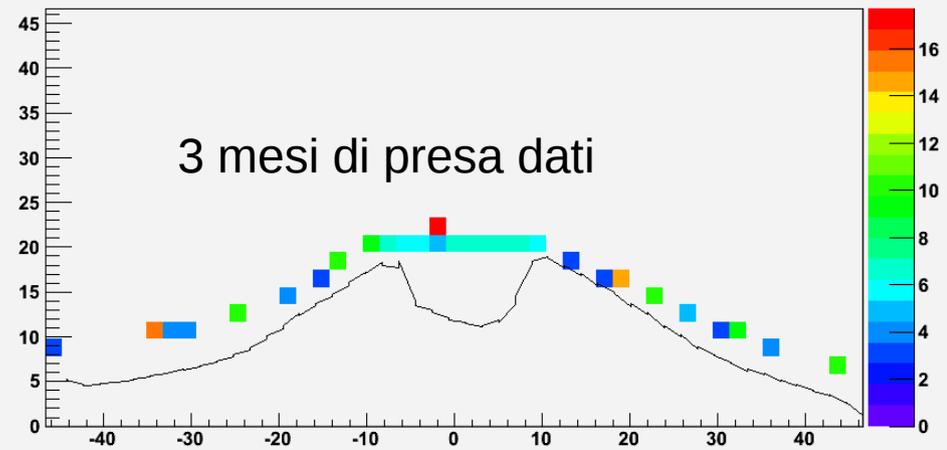


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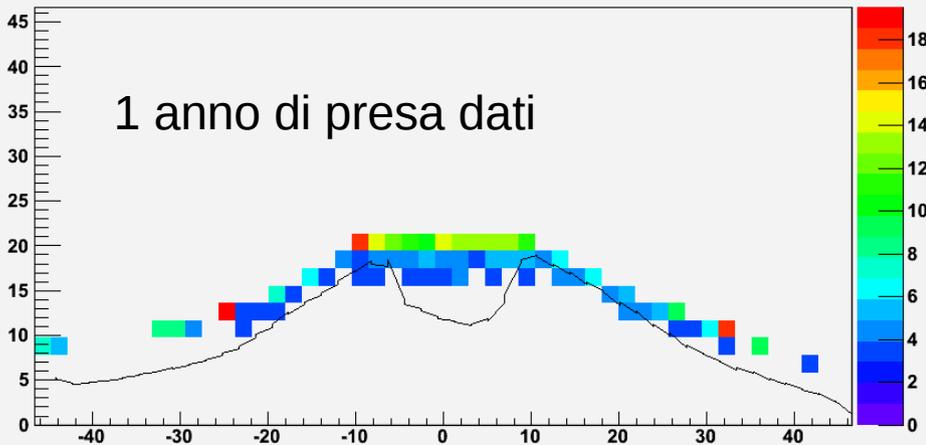
Number of entries (365 days m²)



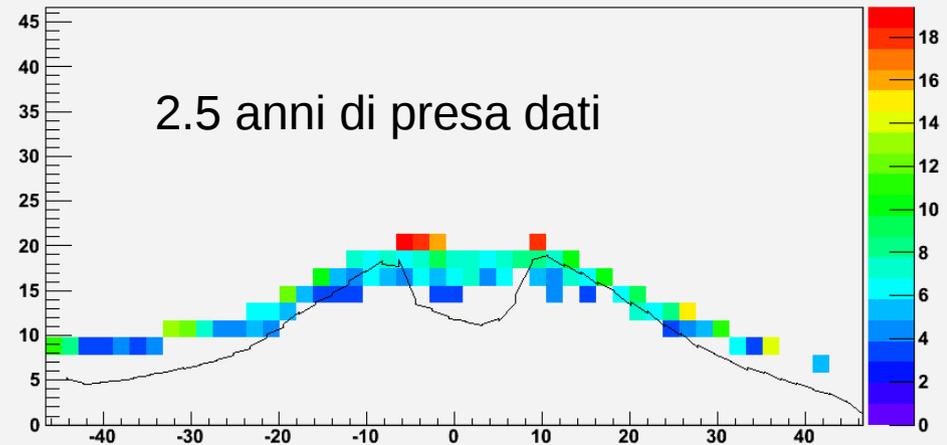
S: 3 mesi



S: 1 anno



S: 2.5 anni





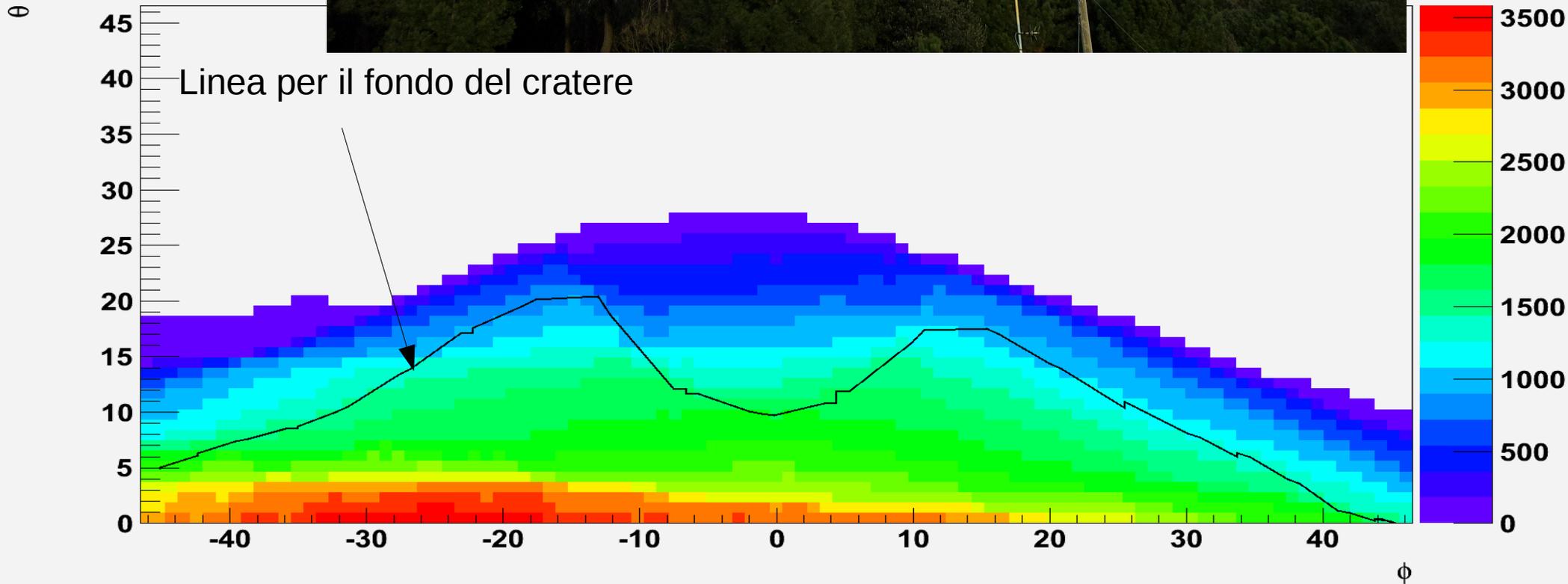
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Posizioni a quota "media":
De Gregorio 760 m
Strada Matrone 800 m

De Gregorio quota 760 m



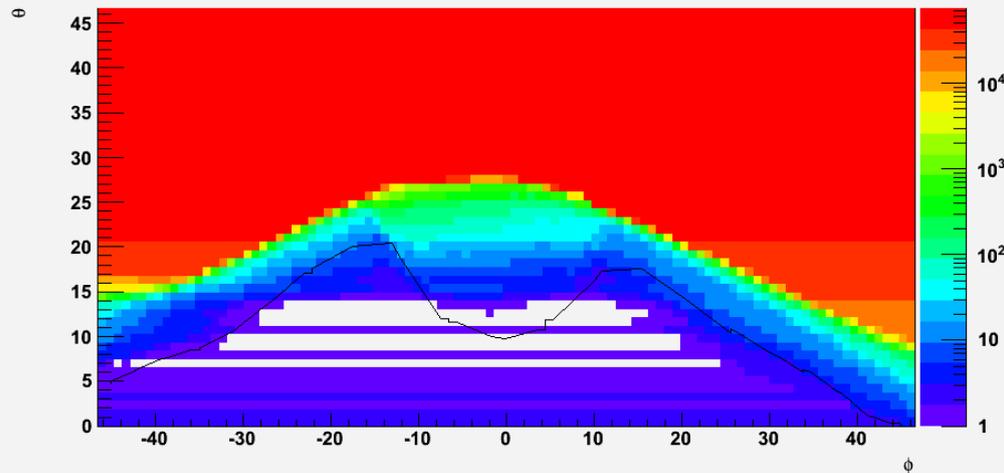
Rock thickness



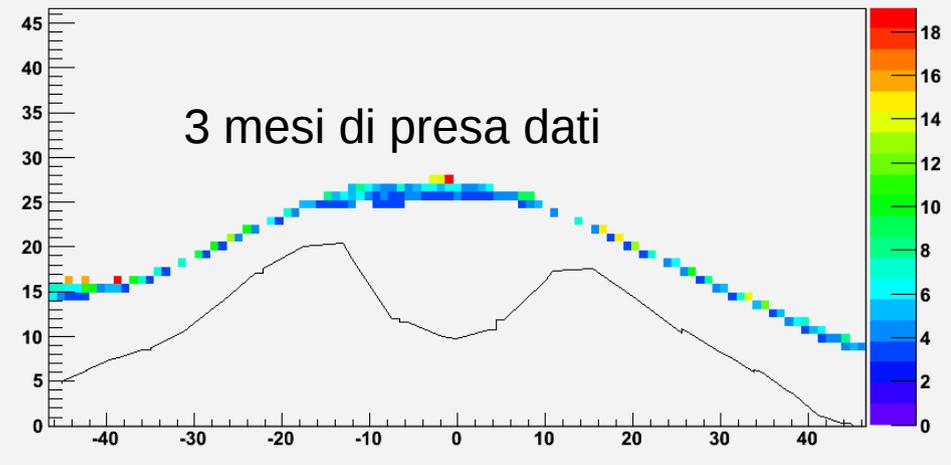
Risoluzione 16 mrad



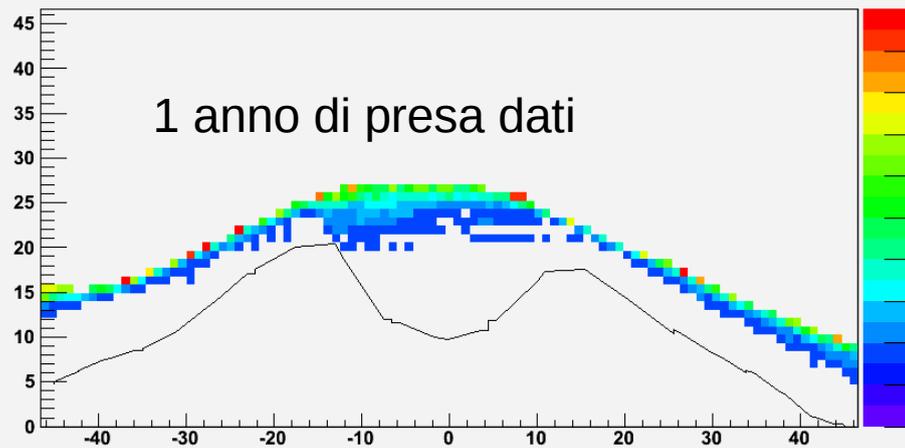
Number of entries (365 days m²)



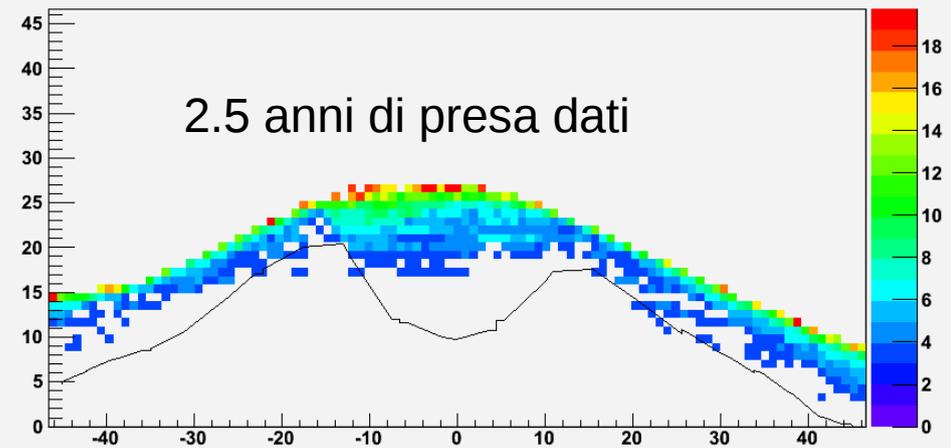
S: 3 mesi



S: 1 anno

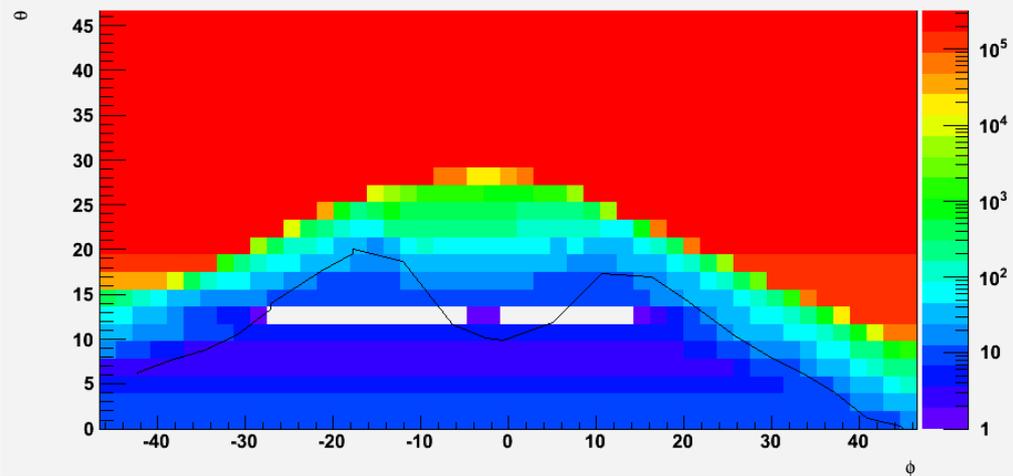


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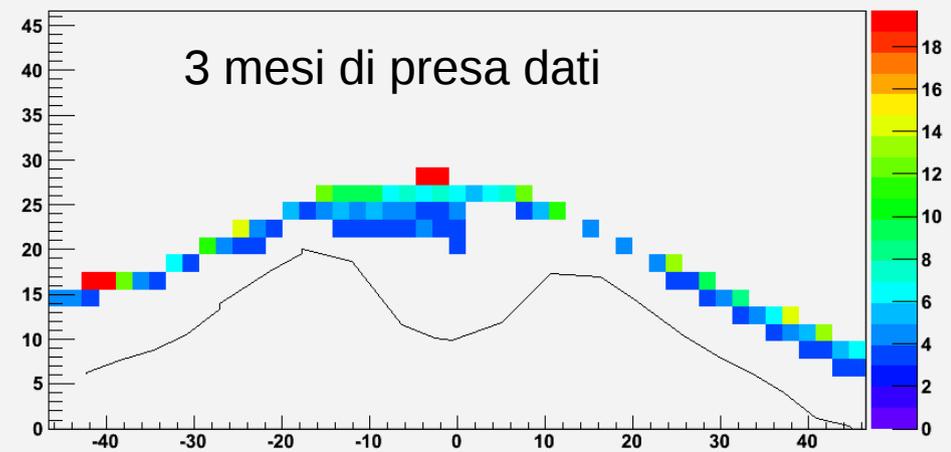


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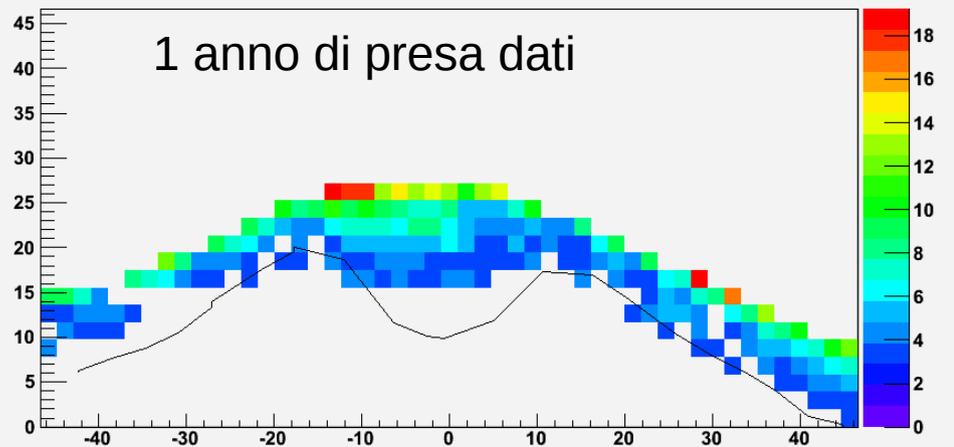
Number of entries (365 days m²)



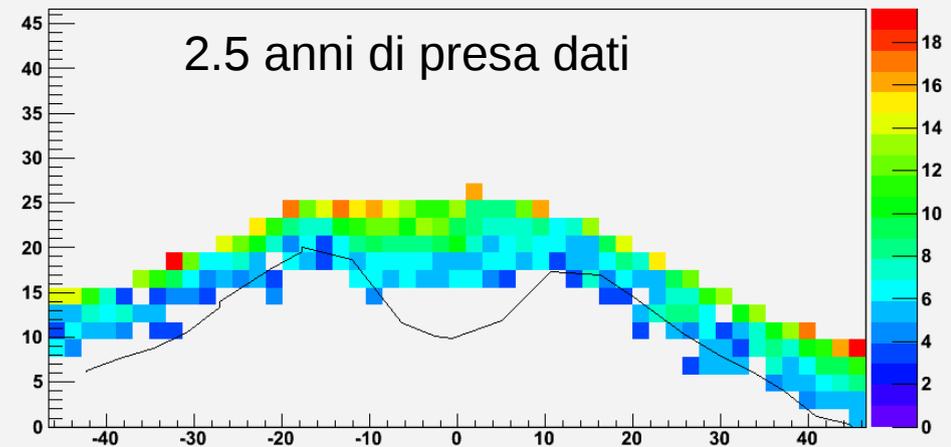
S: 3 mesi



S: 1 anno



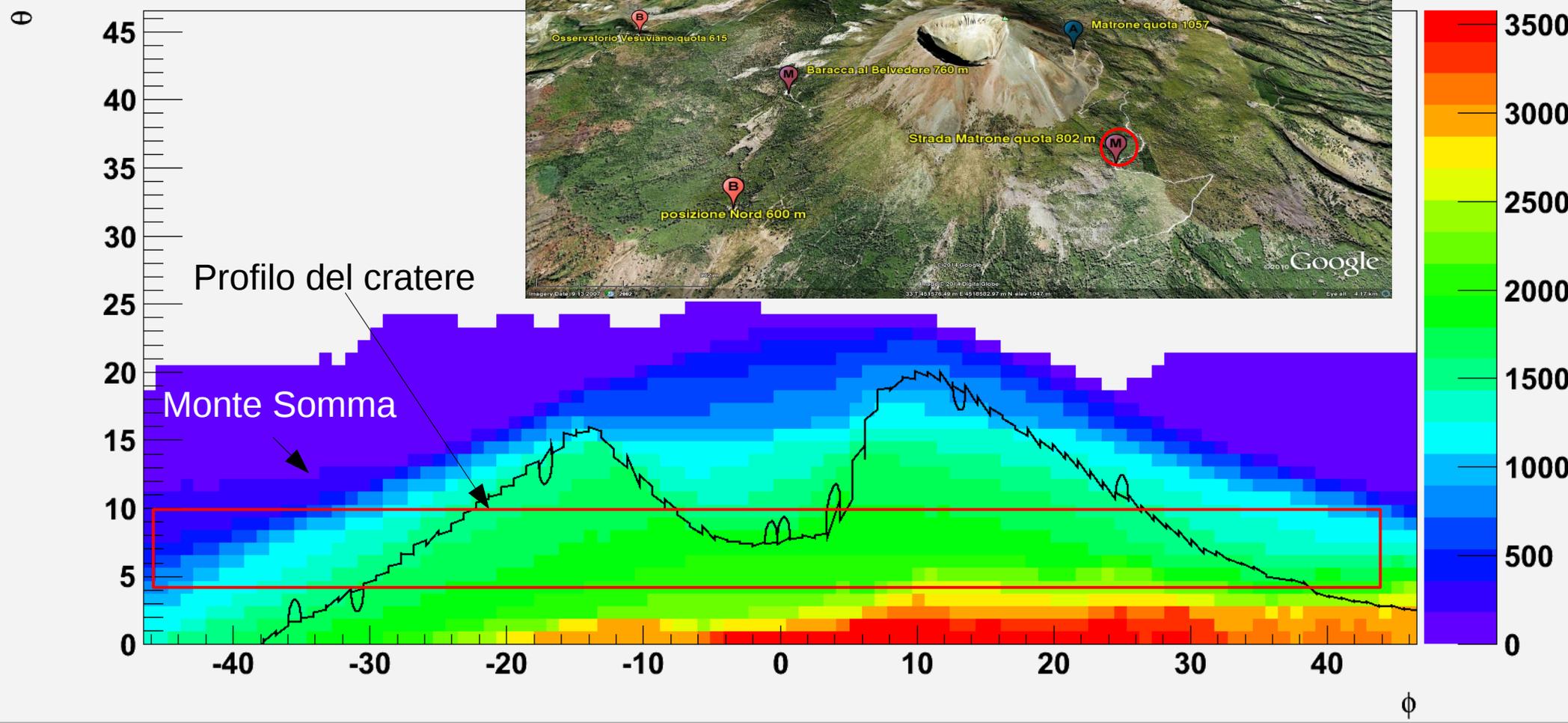
S: 2.5 anni



Strada Matrone quota 800 m

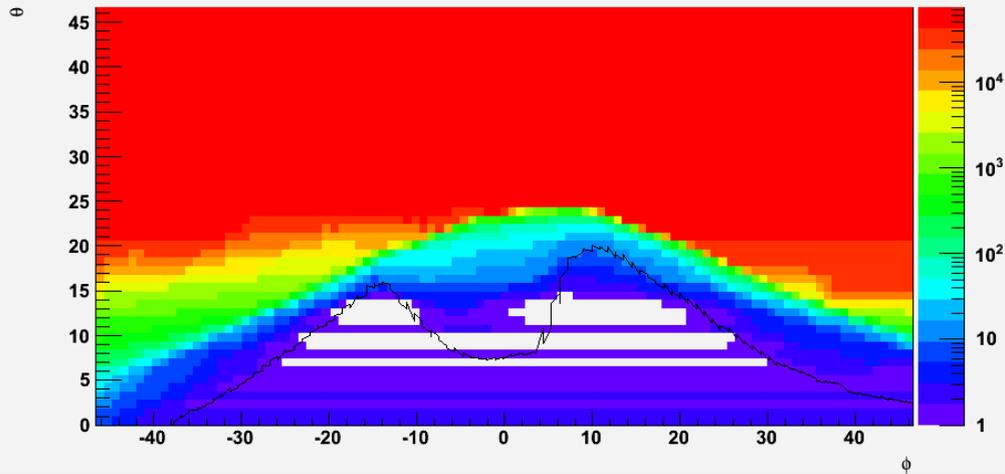


Rock thickness

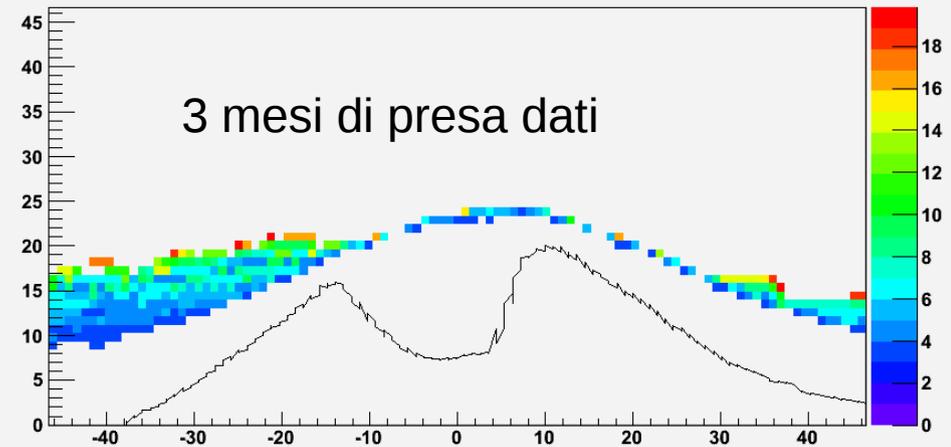


Risoluzione 16 mrad

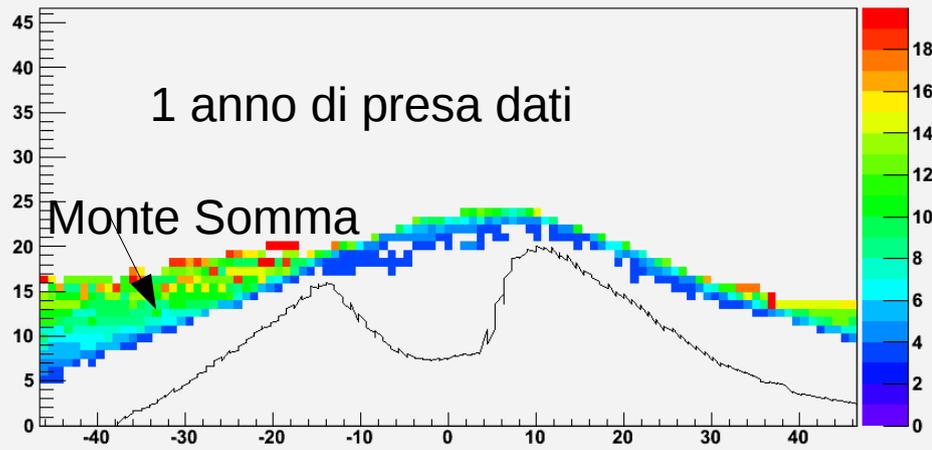
Number of entries (365 days m²)



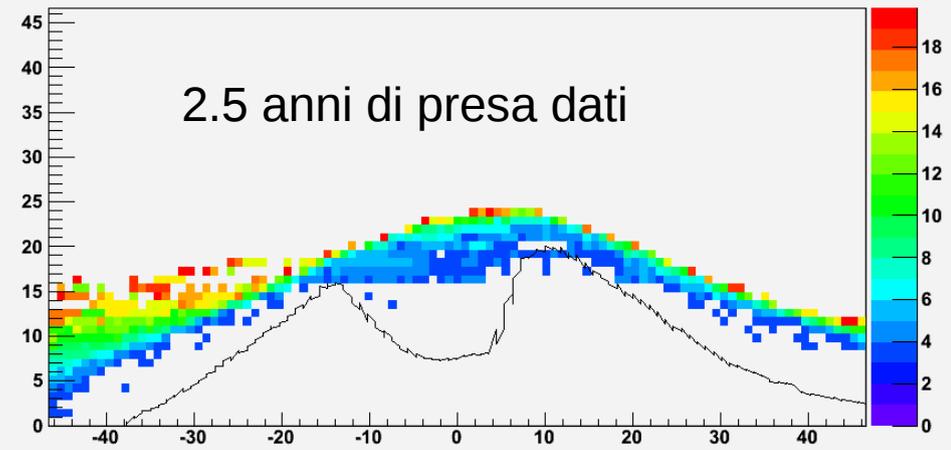
S: 3 mesi



S: 1 anno

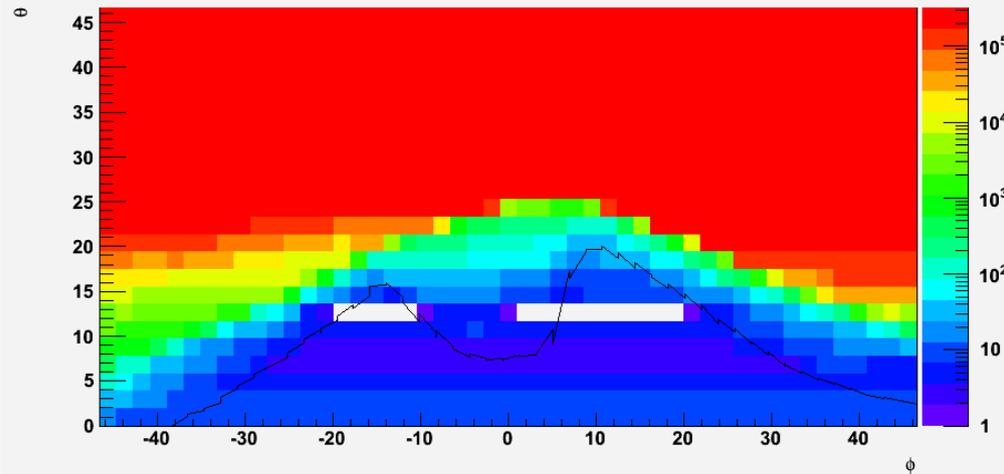


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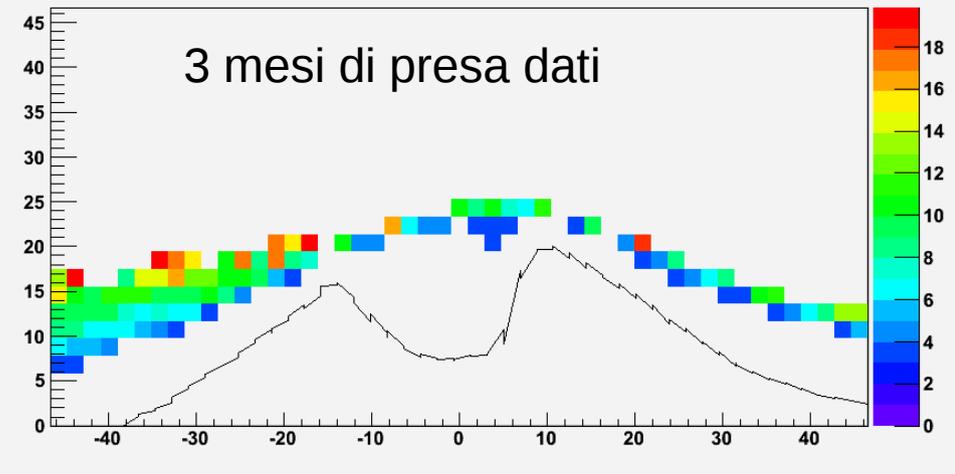


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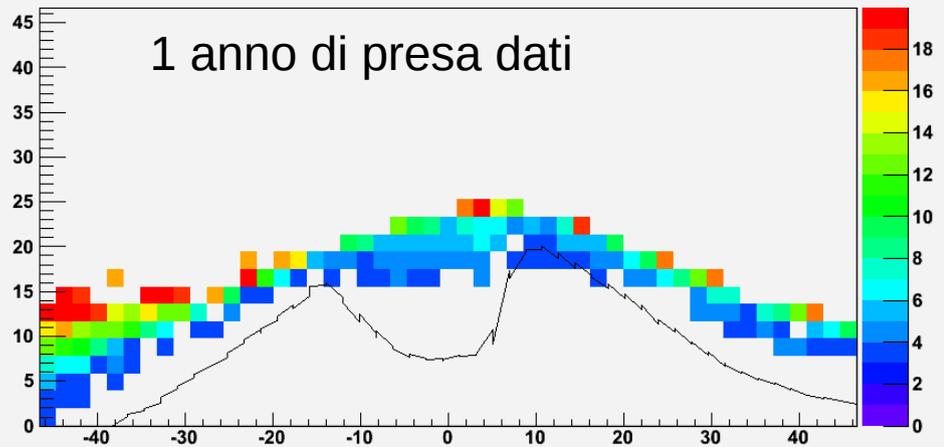
Number of entries (365 days m²)



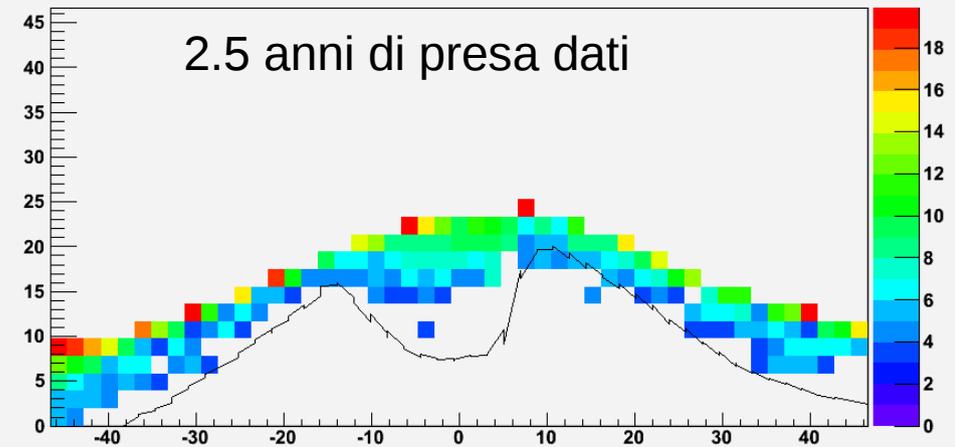
S: 3 mesi



S: 1 anno



S: 2.5 anni



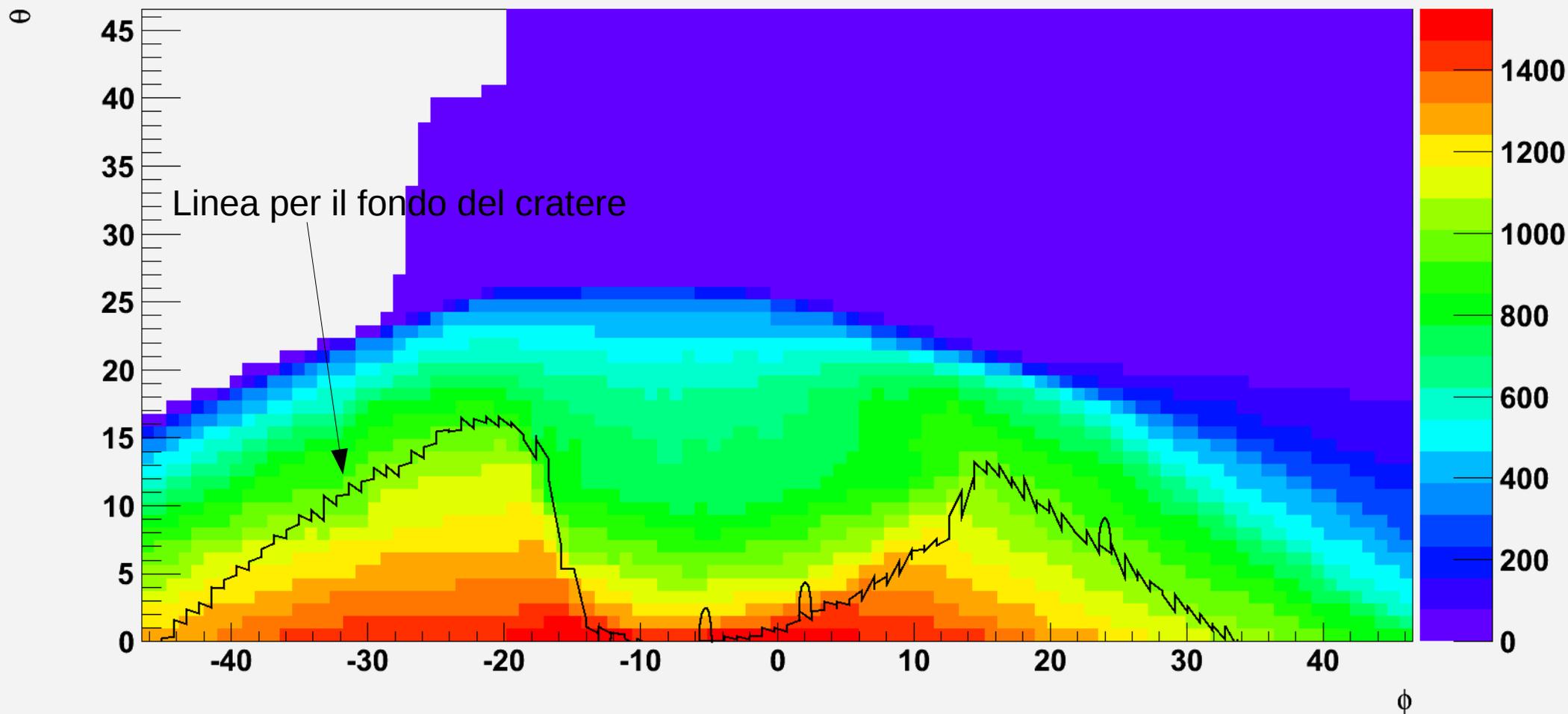


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Posizioni a "alta" quota:
Casina Imbo 970 m
Strada Matrone 1057 m

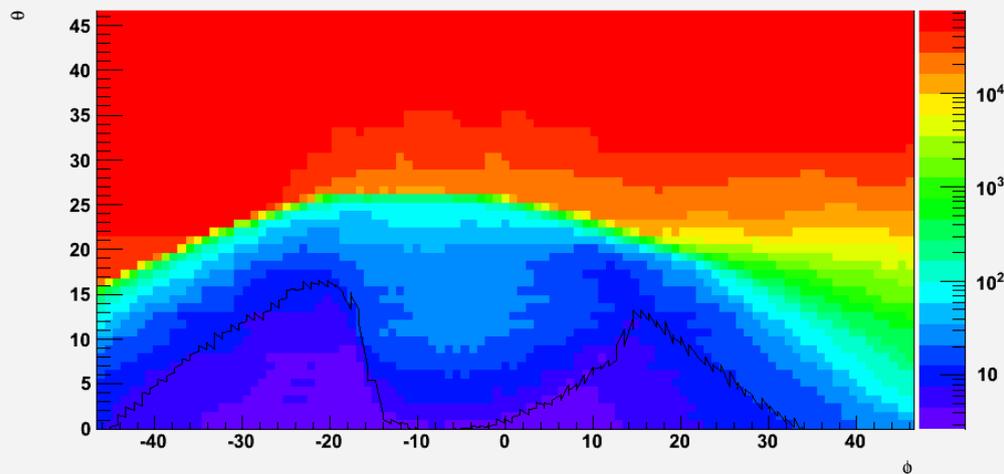
Casina Imbo quota 960 m

Rock thickness

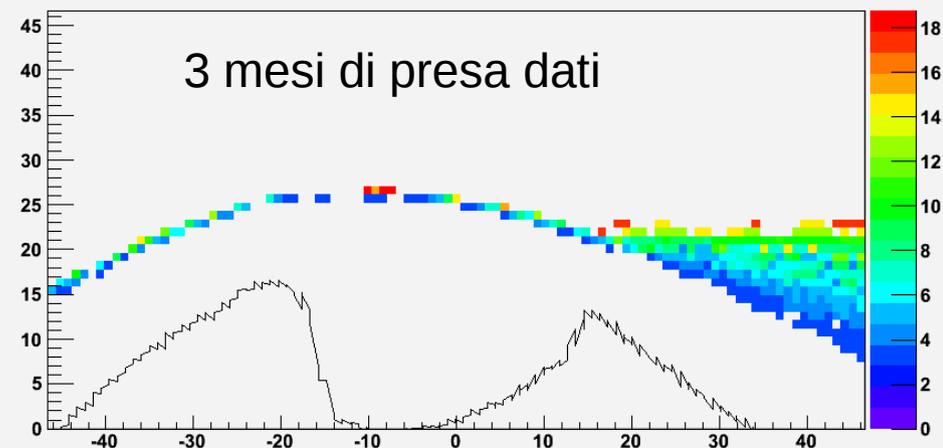


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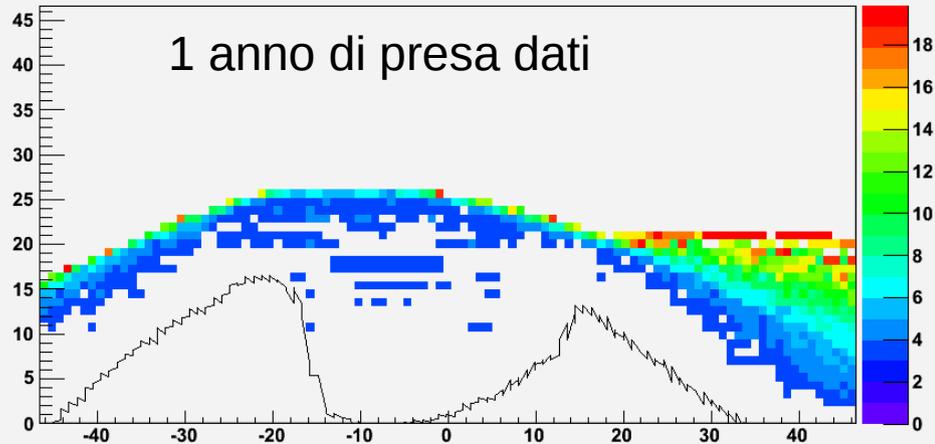
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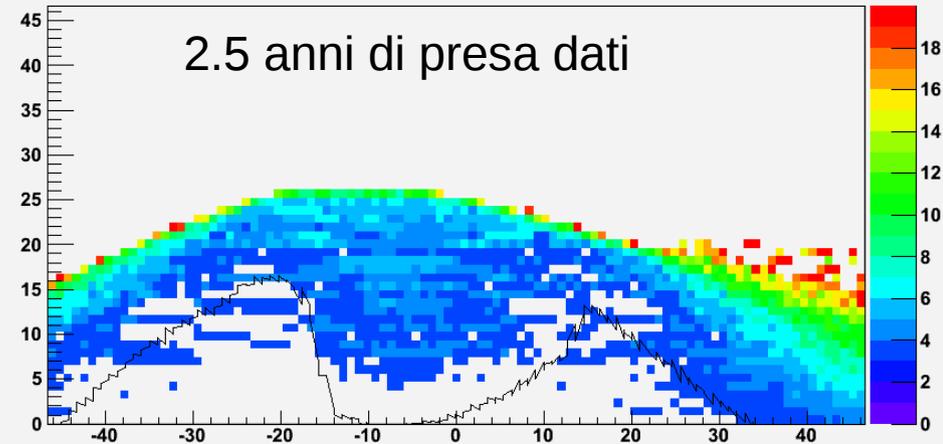
S: 3 mesi



S: 1 anno

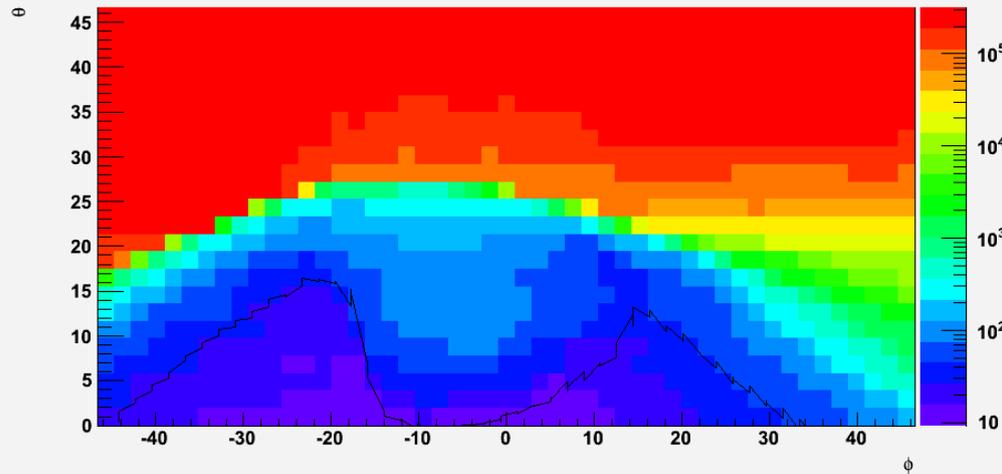


S: 2.5 anni

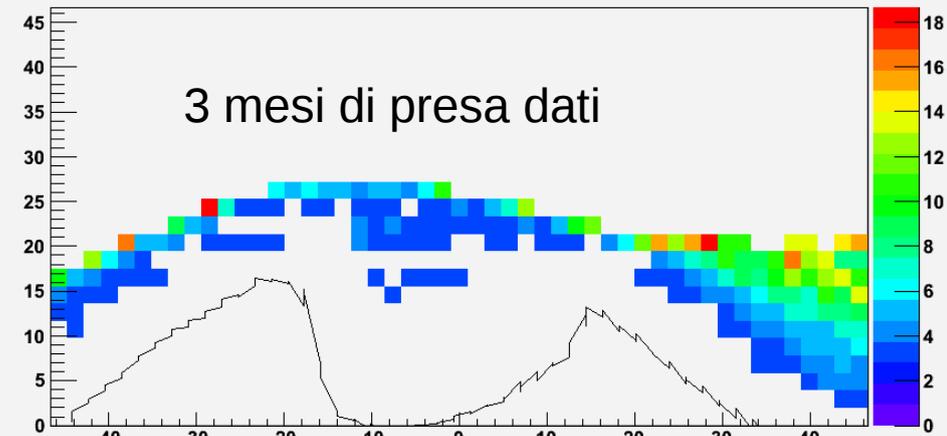


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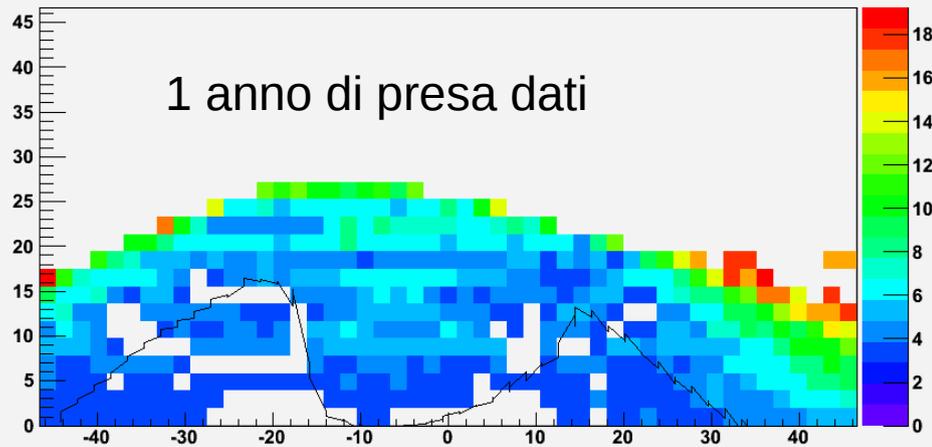
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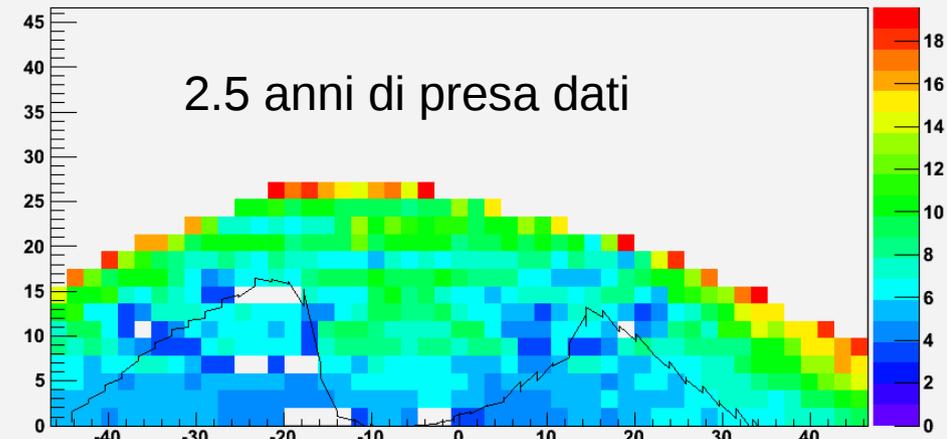
S: 3 mesi



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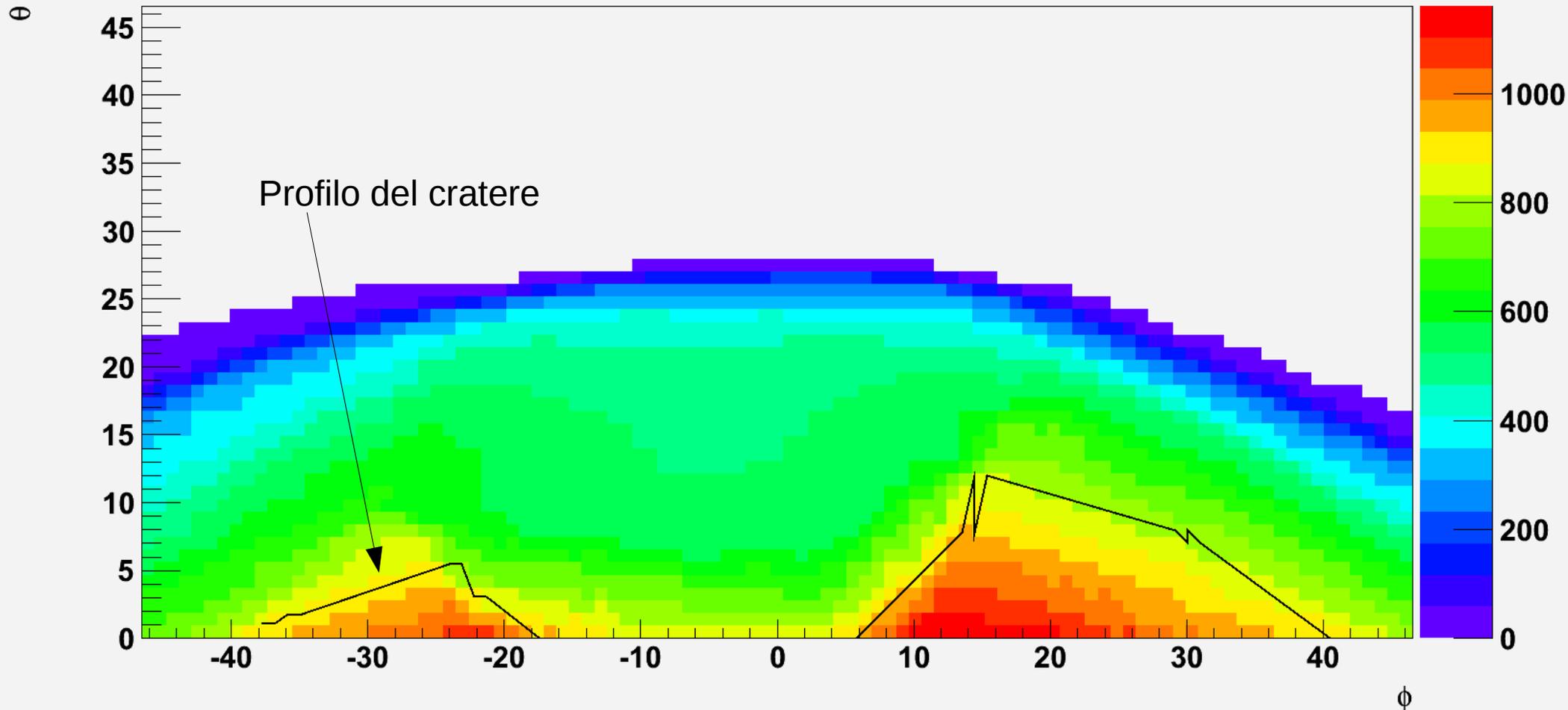


S: 2.5 anni



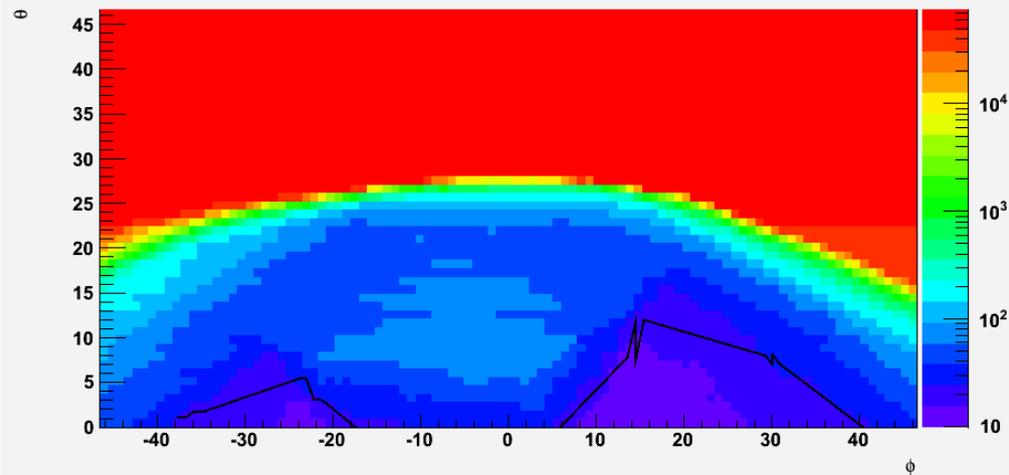
Strada matrone quota 1057 m

Rock thickness

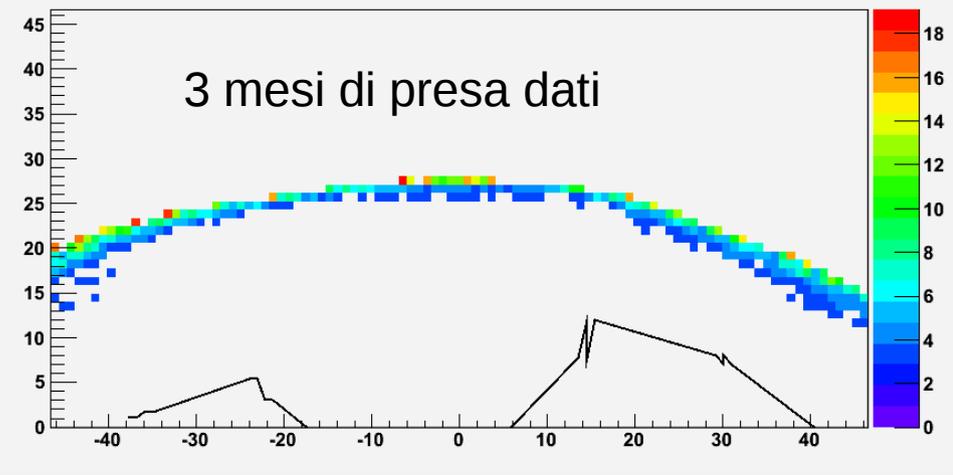


Risoluzione 16 mrad

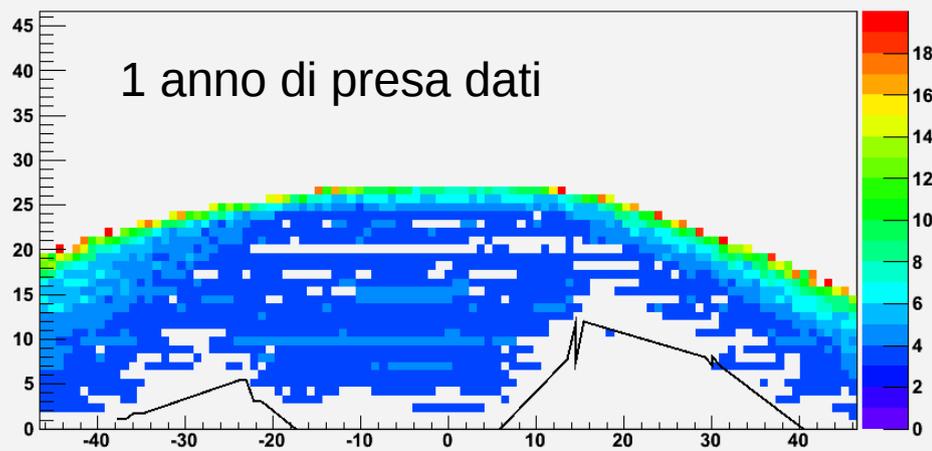
Number of entries (365 days m²)



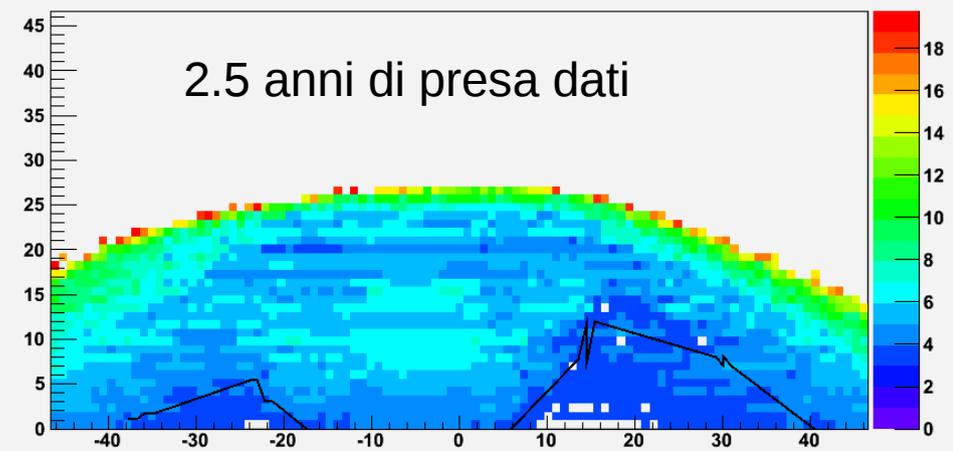
S: 3 mesi



S: 1 anno

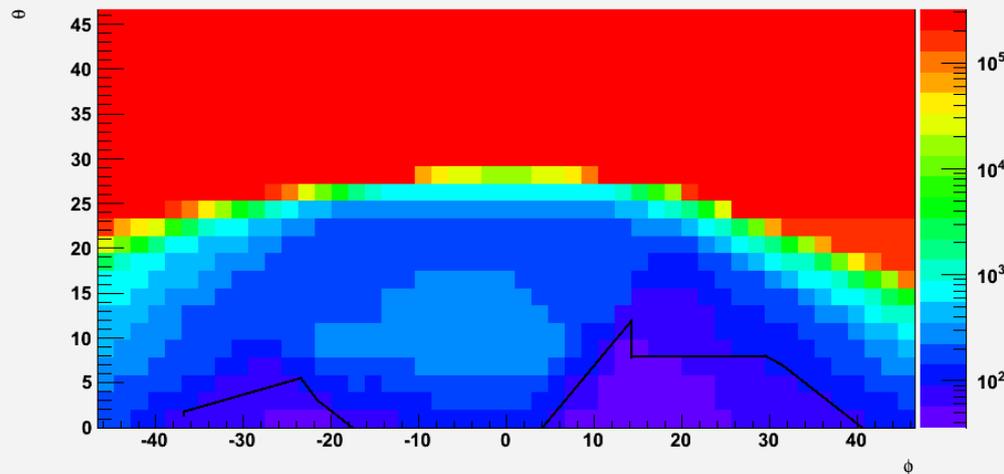


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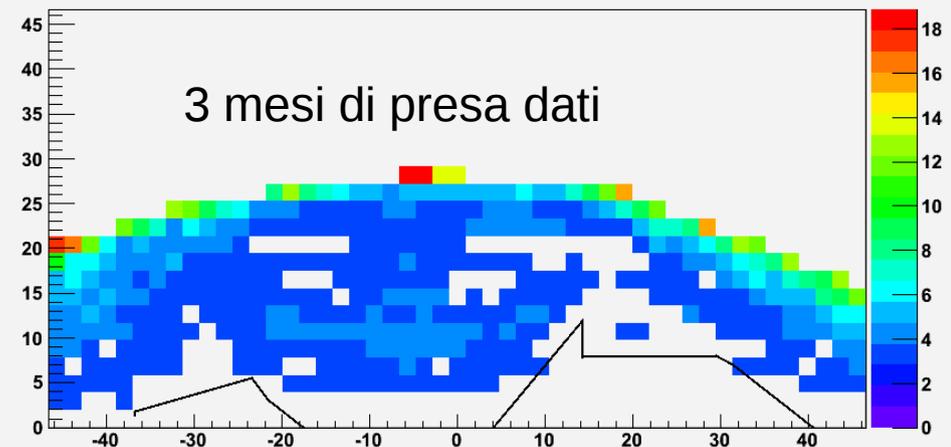


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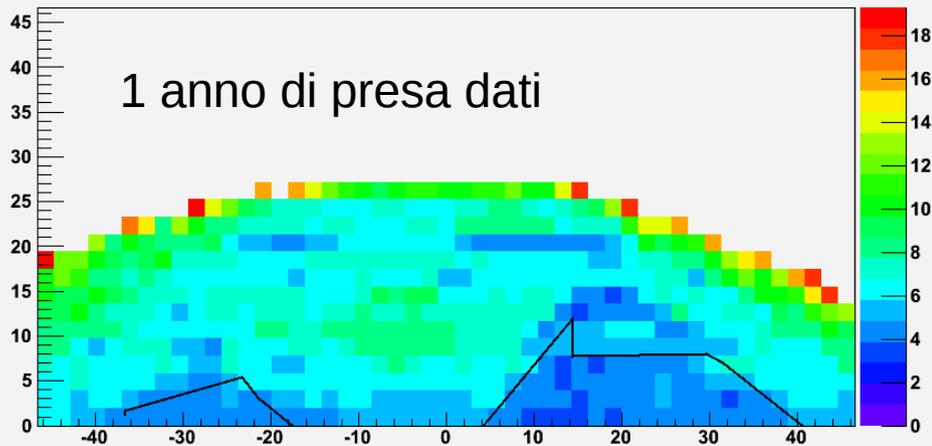
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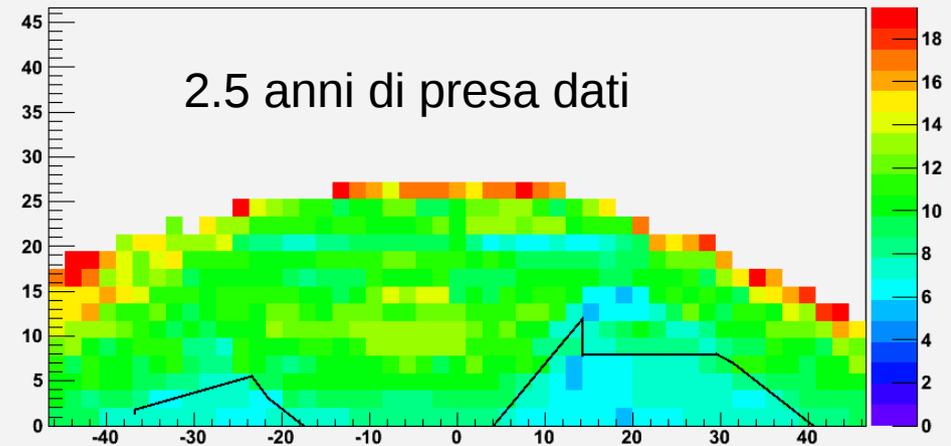
S: 3 mesi



S: 1 anno



S: 2.5 anni





Conclusioni



Abbiamo presentato 3 diversi scenari:

Bassa quota

Media quota

Alta quota

selezionando con Massimo 6 posizioni differenti.

Le Posizioni a “bassa” e “media” quota:

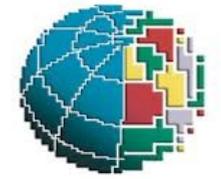
- _ vantaggi logistici (Osservatorio, Casine Forestali);
- _ si può studiare la sola “pelle” del cretere;

Le posizioni ad alta quota:

- _ Casina Imbo logisticamente favorevole;
- _ rendono possibile lo studio del cratere ma si trovano a quote piu' alte del fondo (951).



Template



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Template



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