Extreme Energy Events
Science inside Schools

Measurement of the speed of muons
International muon week

http://www.i2u2.org/elab/cosmic/home/project.jsp

Silvia Pisano

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and Laboratori Nazionali di Frascati - INFN

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Measurement of the muon speed

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«Dear Cosmic Ray Experimenters,

International Muon Week has begun! It's not too late to participate if you'd like to join in!

We have asked participants to measure the speed of muons, but if you want to tackle something a

bit easier, your group can take data measuring the flux of muons as usual. Even if you can't

participate this week, consider measuring the muon speed sometime over the next few weeks and sharing your results with others.

I've also cced this as a late invitation to our Global Cosmics colleagues. Please contact me if you have any questions.

Regards,
Mark»

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Measurement of the muon speed

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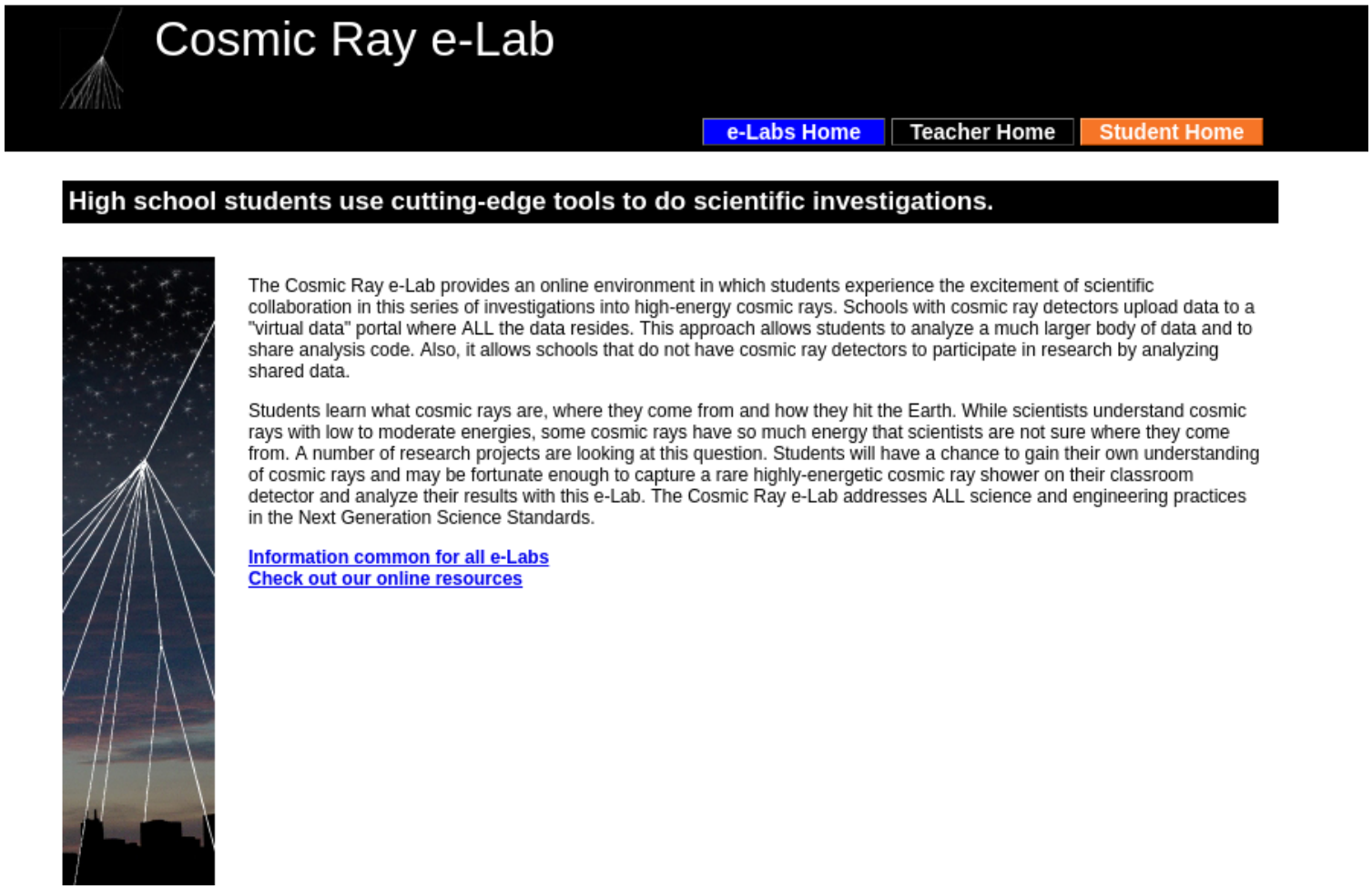

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A perfect tool for the purpose: an EEE telescope

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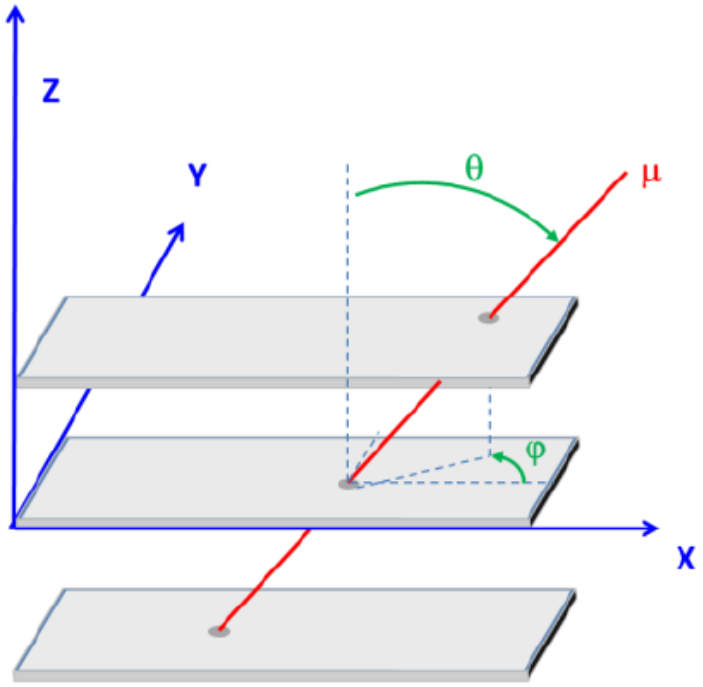

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…an its data

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Progetto Extreme Energy Events - La Scienza nelle Scuole

EEE MONITOR - DQM

[Official address: http://eee.centrofermi.it/monitor]

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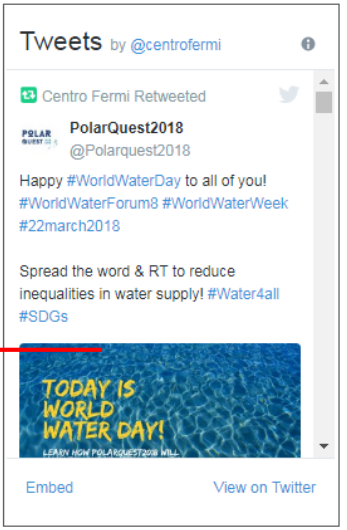
Ultimo aggiornamento: ore 10:14 - lunedì 26 marzo 2018 [by e3monitor]

[EEE Monitor] RUN4: October 2, 2017 - May 30, 2018
[EEE Monitor] RUN 4 - Data Taking - Day number: 176
Total number of candidate tracks (X^2<10) in the database: 64256720661

SCHOOLs ELOGBOOK for RUN 4 | SHIFTERs ELOGBOOK
Set Automatic Shift REPORT Messages | Automatic Shift Report ARCHIVE
Home Page EEE | Masterclass | Download the Excel Sheet
Coincidences | Connectivity Report | Data Request

La tabella qui sotto mostra la situazione dei telescopi in acquisizione:
In **verde** sono indicati i telescopi in presa dati e trasferimento nelle ultime 3 ore
e con parametri di acquisizione ragionevoli nell'ultimo run analizzato.
In **giallo** sono indicati i telescopi in cui trasferimento e/o acquisizione sono sospesi da più di 3 ore
o con tracce (X^2<10) minori di 10 Hz nell'ultimo run analizzato.
In **rosso** sono indicati i telescopi in cui trasferimento e/o acquisizione sono sospesi da più di due giorni
o con tracce (X^2<10) minori di 5Hz nell'ultimo run analizzato.



School	Day	Time	Name of the last trasferred File	Number of Files trasferred today	Last Entry in the e-logbook of the Schools	Name of the last File analyzed by DQM	DQM daily report	RATE of Triggers for the last Run in DQM	RATE of Tracks for the last Run in DQM	Link DQM
ALTA-01 *[Event Display]*	lun 26 marzo	09:07	ALTA-01-2018-03-26-00018.bin	17 *[History]*	11:30 24/03/2018	ALTA-01-2018-03-26-00018.bin	26/03 *[History]*	27.0	22.0	ALTA-01
ANCO-01 *[Event Display]*	lun 26 marzo	08:22	ANCO-01-2018-03-26-00012.bin	12 *[History]*	13:47 22/03/2018	ANCO-01-2018-03-26-00012.bin	26/03 *[History]*	19.0	15.0	ANCO-01

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Access to data

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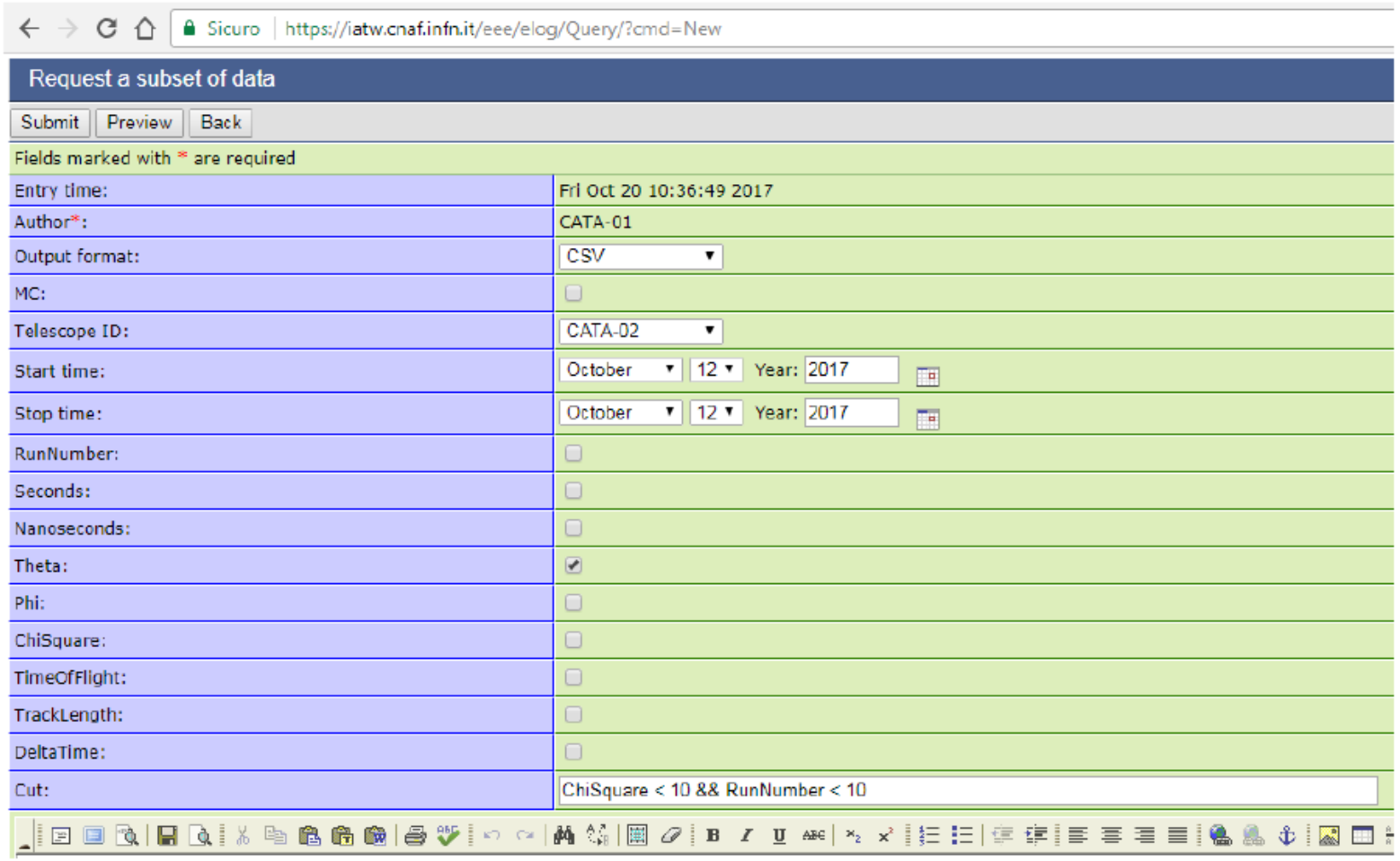

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see instructions for the International Cosmic Day

How to perform and optmize the measurement?

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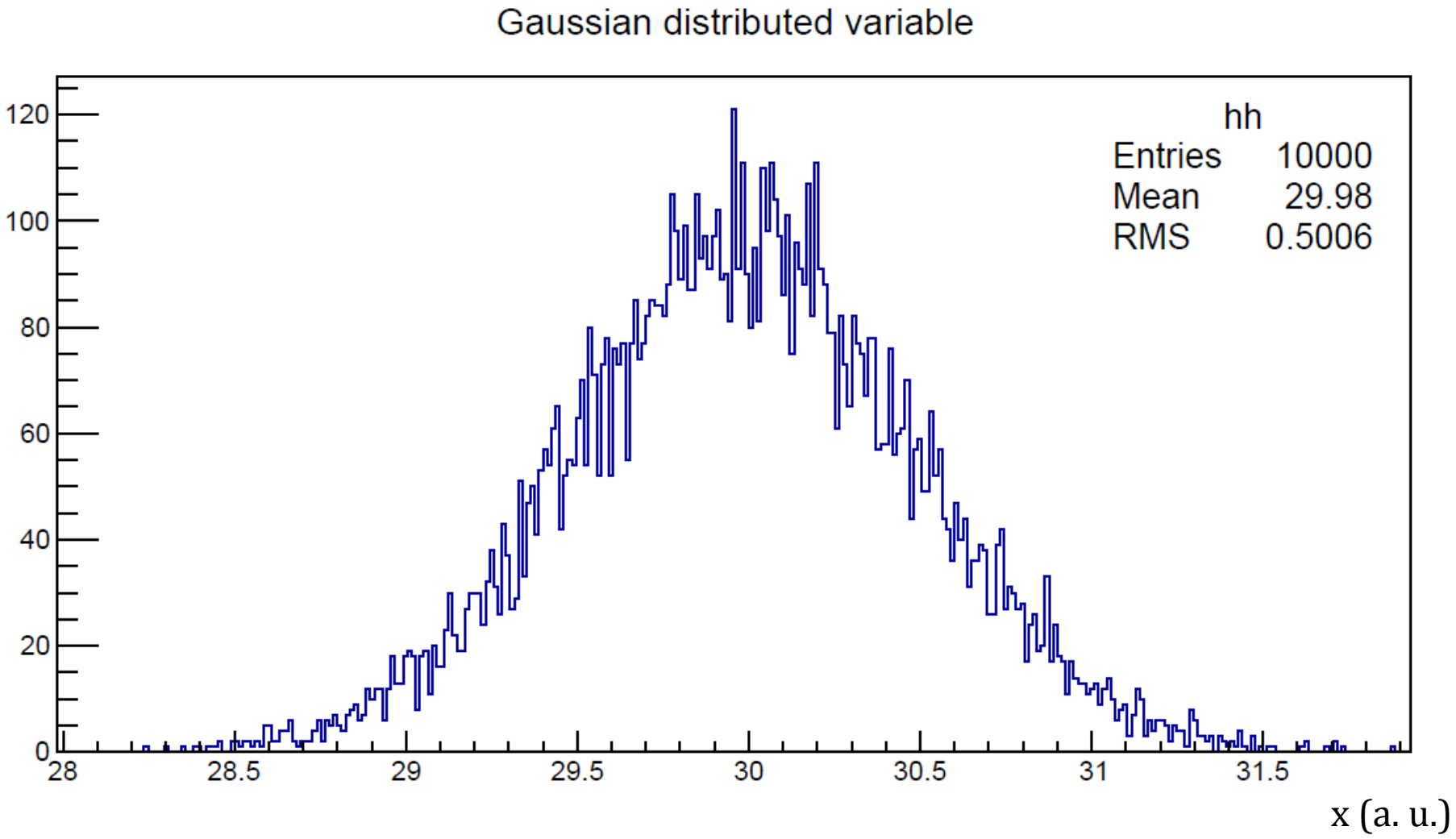
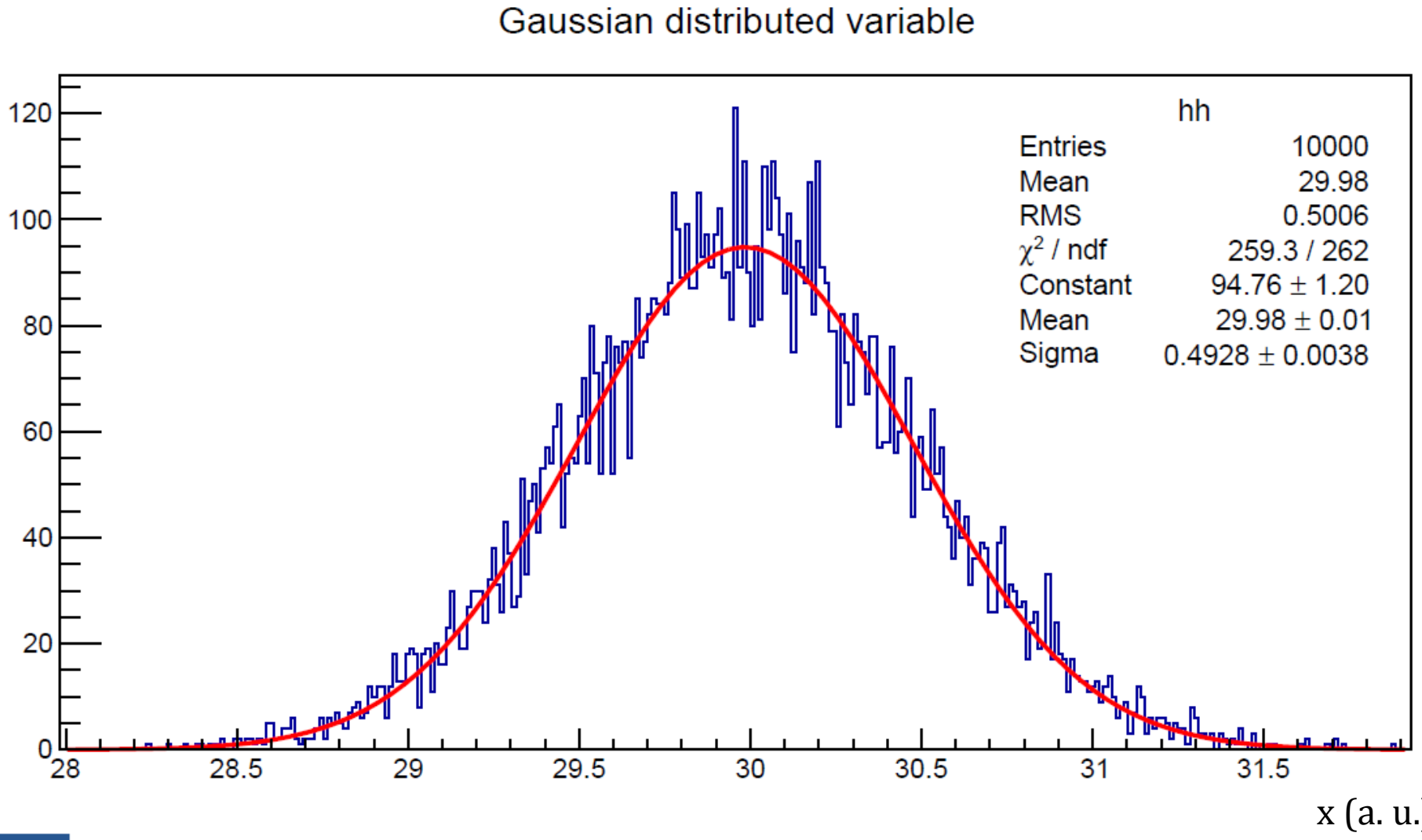
- What are the relevant variables?
- How do we get to the muon speed?
- How do we extract the final value?
- How many data points? How many stations to be included? The more the better?
- What is the precision of the measurement?
- How to optmize it?
- **Comment on the results: how the measured value compares with other fundamental quantities (*e.g.*, *c*)?**

Statistics: mean



Statistics: *fitted* mean



- The measurement can be done at different levels: it is left to your own initiative to optimize it
- Final results will be presented in the next EEE run coordination meeting on a voluntary base
- If no volunteers will be found, schools will be extracted randomly to present their results
- **Best measurement/presentation will be awarded**

Do not try to corrupt your local referent to get help!