

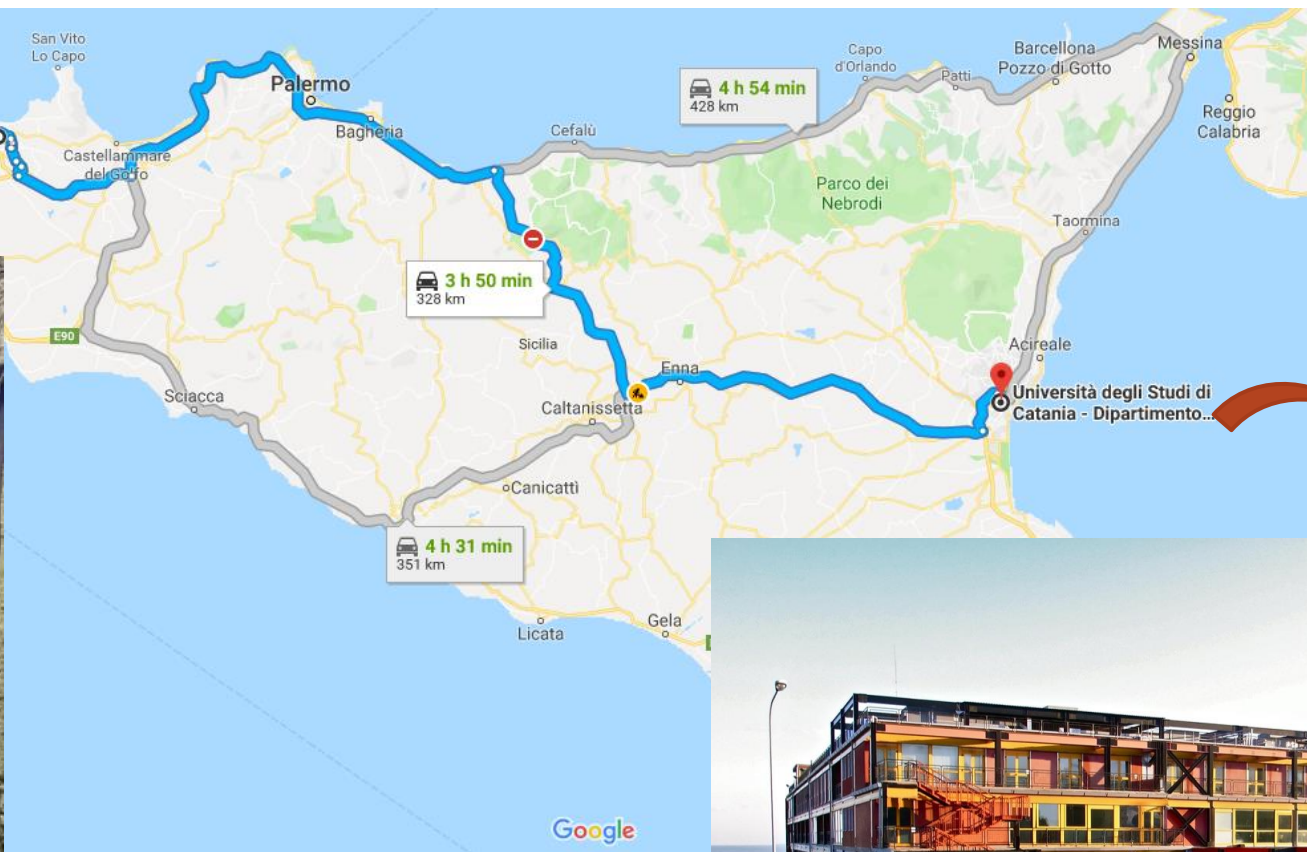
INSTALLATION AND PRELIMINARY MEASUREMENTS WITH POLA-01 IN CATANIA

19/12/2018

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Outline

- Installation in the Physics and Astronomy Department in Catania;
- Two sets of measurements, inside and outside CATA-01 acceptance;
- Preliminary results on angular distributions.

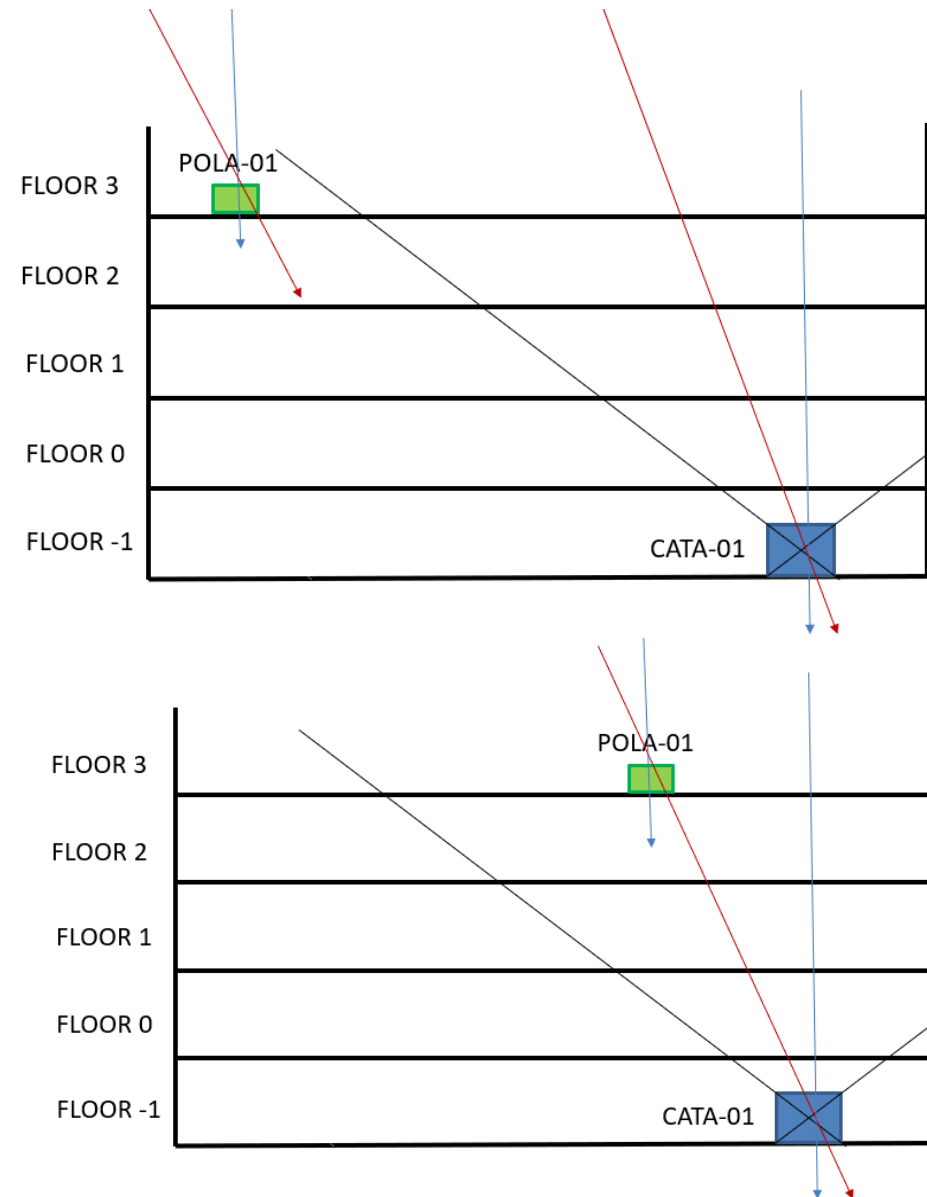


8/12/2018 from Erice to Catania

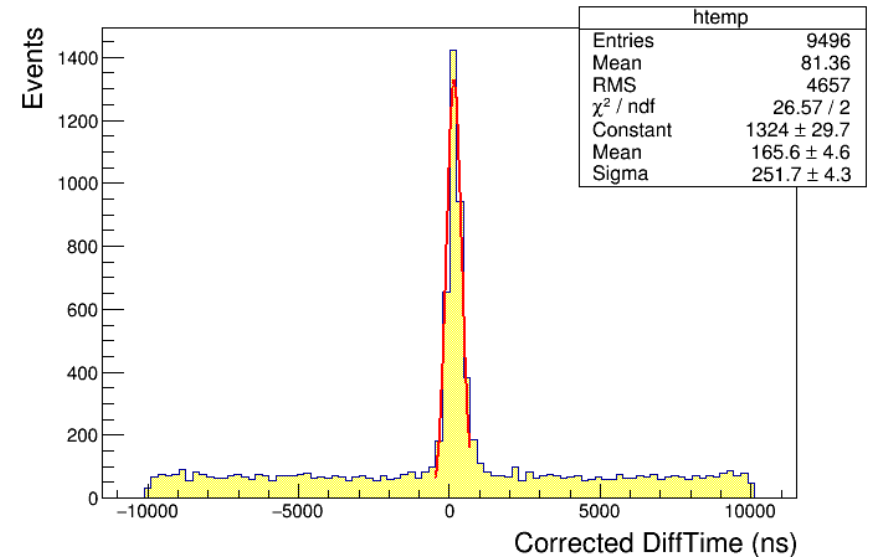
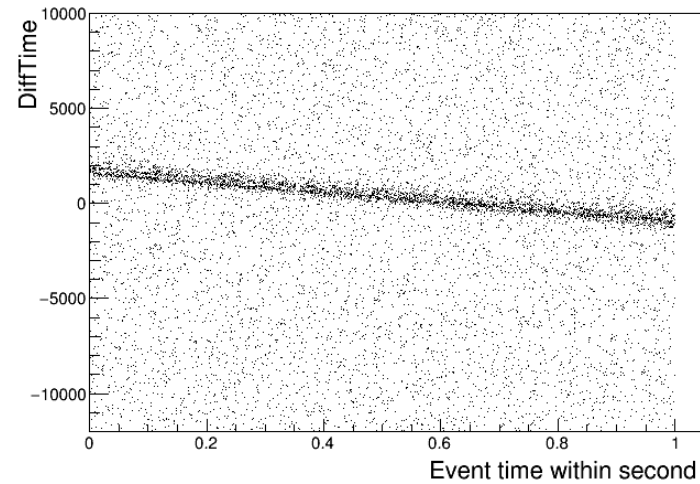
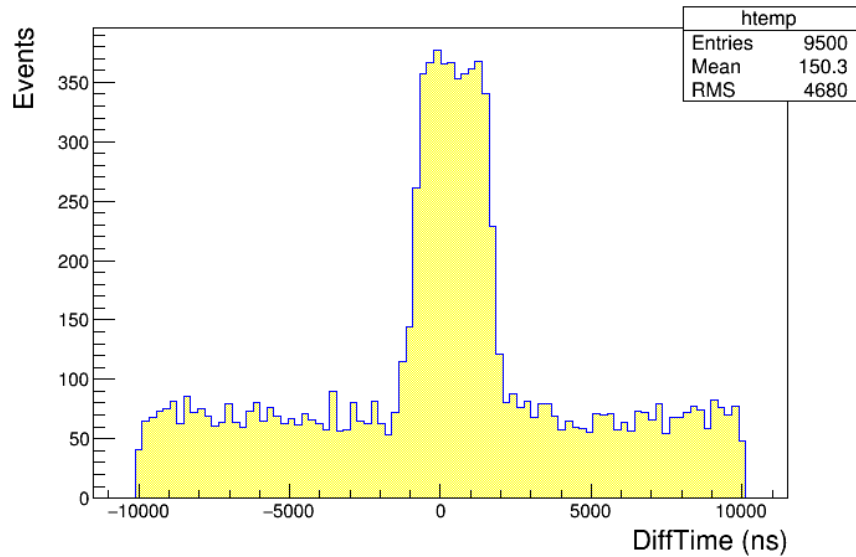
Thanks to the support of several people!

Measurements

- Measure 1 – outside the acceptance interval of CATA-01, in order to detect two independent muons coming from the same shower. About 3 days acquisition time.
- Measure 2 – inside the acceptance interval of CATA-01, in order to detect also muons passing through both detectors. Detectors geometry select a narrow acceptance cone (POLA-01: 40 cm x 60 cm). About 5 days acquisition time, but still running.

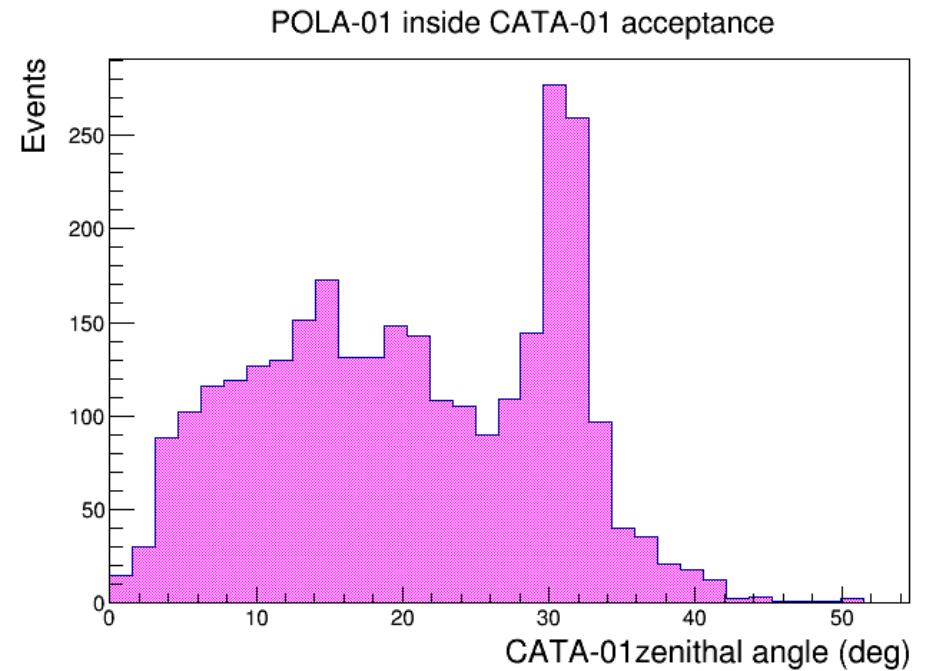
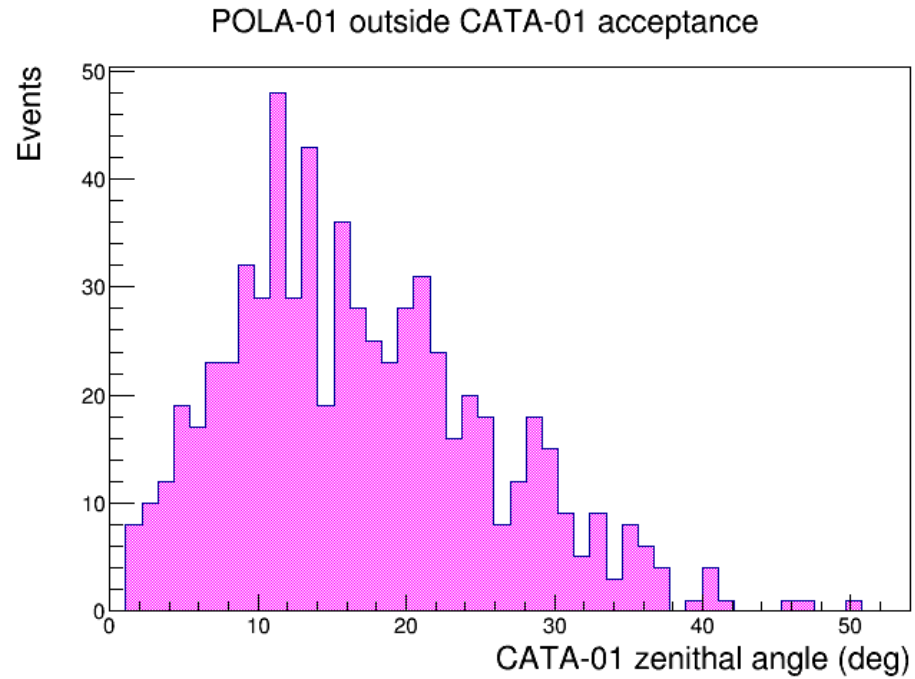


Time difference



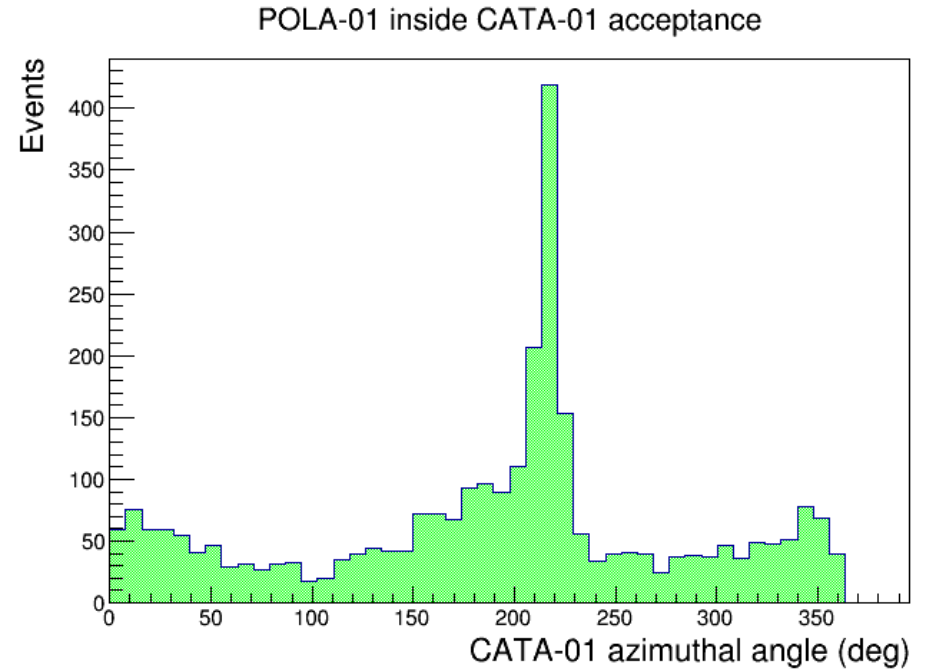
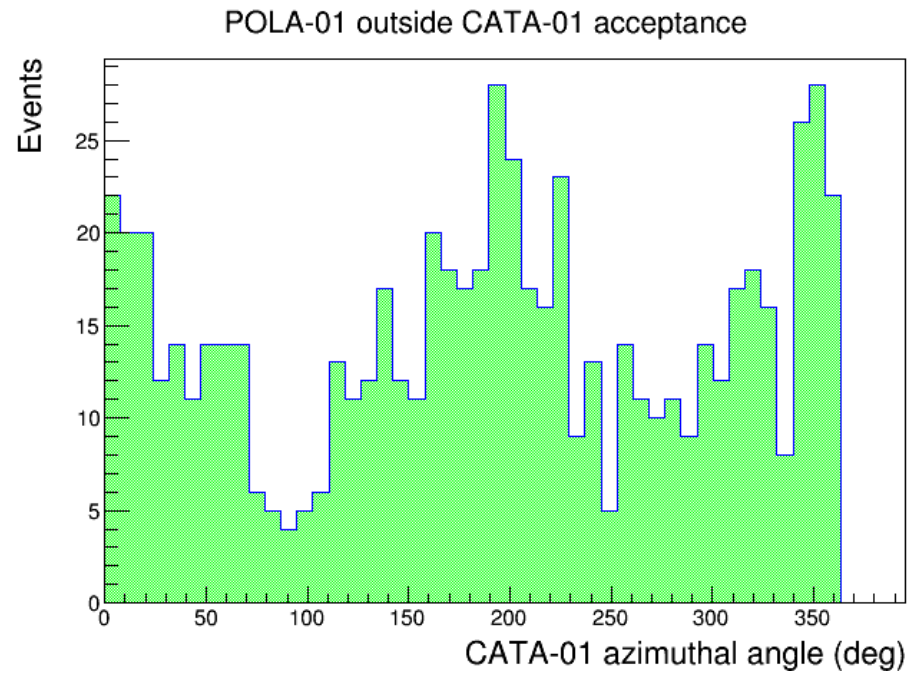
- Data collected during 10-18/Dec/2018
- Time difference between CATA-01 and POLA-01 data
- Corrected by a factor depending on clock drift (line's slope)

Theta distribution



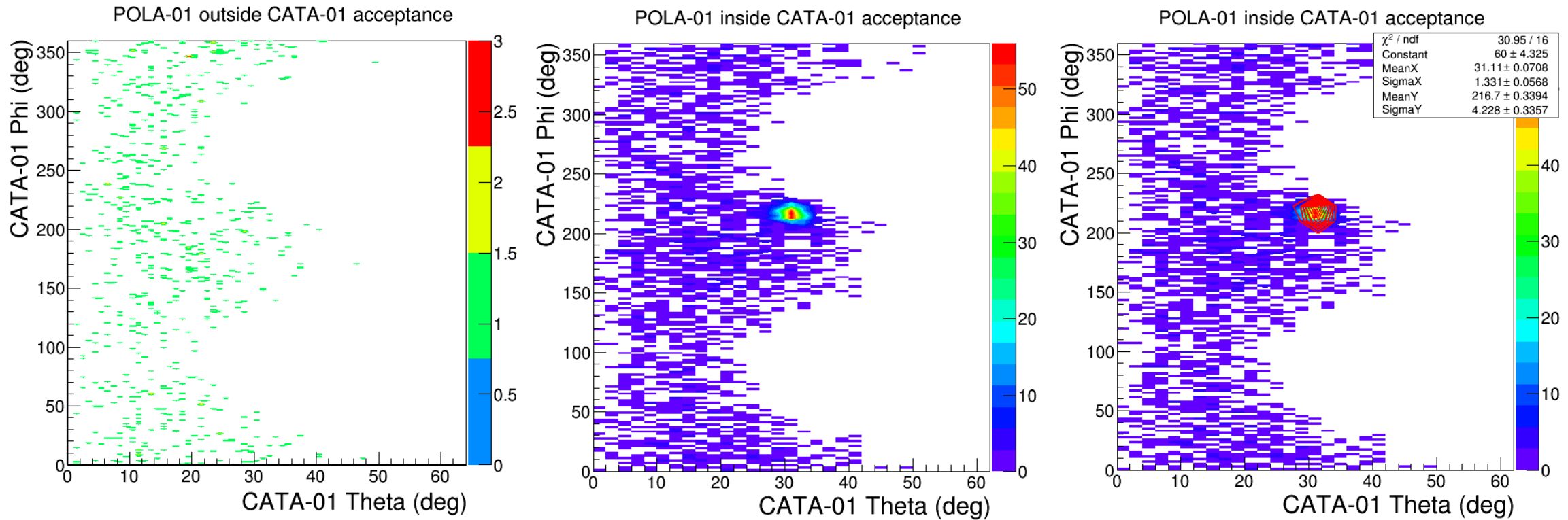
Selecting coincidence events in the time spectrum, theta distribution is extracted.

Phi distribution



Selecting coincidence events in the time spectrum, phi distribution is extracted.

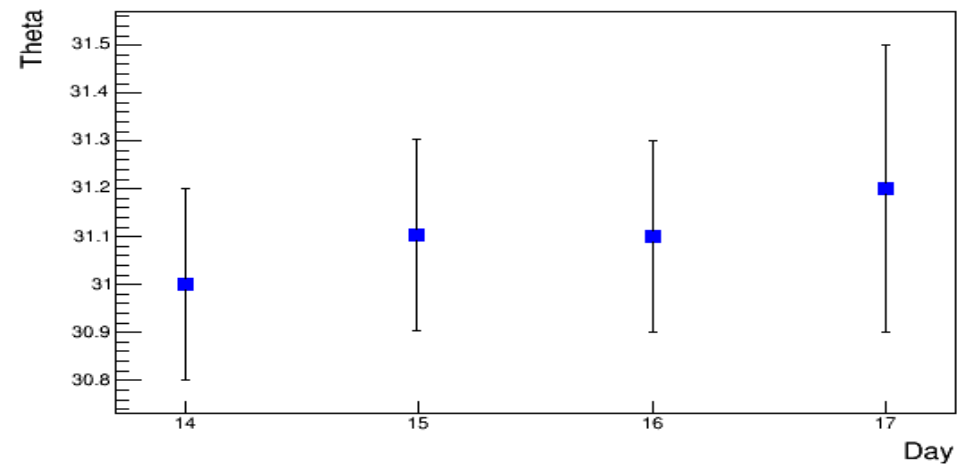
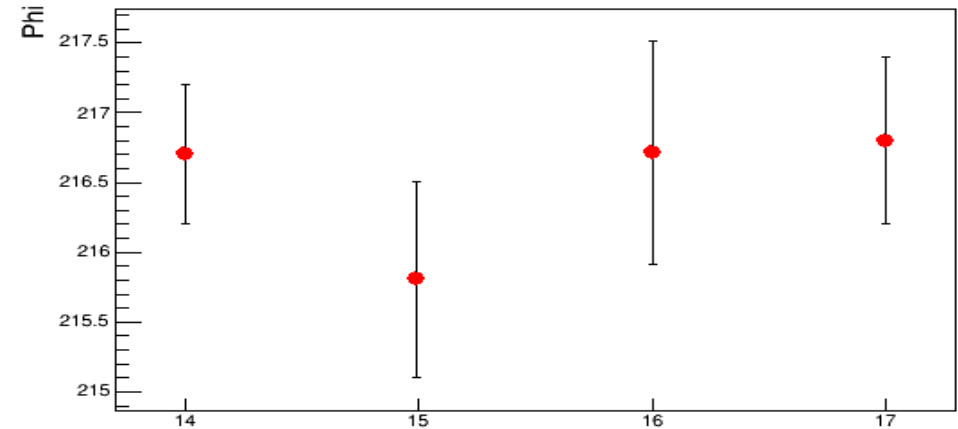
Theta-Phi correlation



- Zenithal angle distribution – inside CATA-01 acceptance interval $\langle \theta \rangle \sim 31.11^\circ \pm 0.07^\circ$
- Azimuthal angle distribution – inside CATA-01 acceptance interval $\langle \phi \rangle \sim 216.7^\circ \pm 0.3^\circ$

Theta & Phi variation per day

- Extracting centroids day by day one can see that there are no appreciable differences, within the statistical error.



Outlook

- Further analysis on POLA-01 data in correlation with CATA-01 telescope, acquiring more statistics during January;
- Possible measurements of independent muons in coincidence with CATA-01, moving POLA-01 around UniCT-campus;
 - at distance ~ 50 m the rate is around 186/day –
- Measurements as a function of the altitude during a trip to mount Etna from sea level up to about 2000 m.