

# CAC

CHARGE ASYMMETRY IN COSMIC SHOWERS

# CVC

Group 4

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# Experimental setup

Independently calibrated

- 4 scintillators at  $45^\circ$  azimuth, oriented E-W
- Distanced 0.81 m
- Two coincidence modules



# First results **PRELIMINARY**

- Statistics: 940 events
- Positive (from W to E): 493  
Negative (from E to W): 447
- Asymmetry  $A = (N_+ - N_-) / (N_+ + N_-)$ :  
 $A = 4.6 (3.2 \text{ stat}) \%$



# Detector efficiency

- Estimation of systematics from detectors efficiency: flipping the scintillators!
- Second run:  
 $A = -2.0 (5.7 \text{ stat}) \%$
- Averaged result:  
 $A = 2.7 (3.2 \text{ stat}) \%$

# Discussion

- Asymmetry it's consistent with 0:  
**hints of New Physics?**
- Results from second data taking period may solve the puzzle!

# Upgrade

Recent predictions on water-dependent asymmetry motivated an extensive upgrade of experimental setup





# Outlook

- Study of systematic uncertainties:
  - E-W alignment
  - Mechanical structure oscillations ← Non-negligible
- New data coming soon!