CAC

Charge Asymmetry in Cosmic showers

CAC

Group 4

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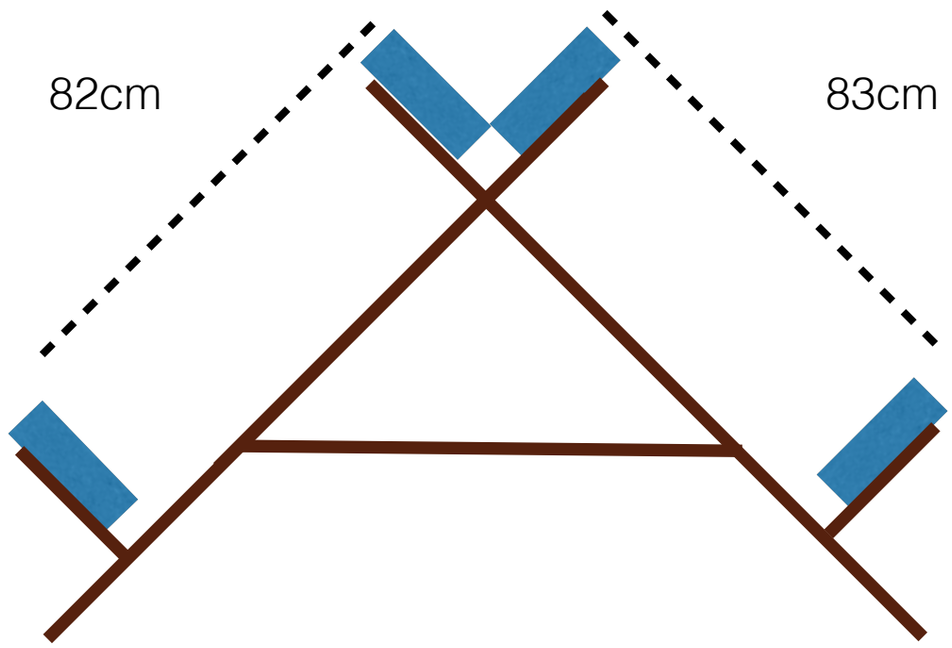
NIKHEF

Experimental setup

Independently calibrated

- 4 scintillators at 45° azimuth, oriented E-W
- Distanced 0.81 m
- Two coincidence modules

Our detector



Opening angle:
$\Omega = 0.9\ \mathrm{sterradian}$

(i.e. we cover 0.9% of the sky)

Considering a **measured starting flux** of our measuring apparatus of **3Hz**, taking into account the opening angle of our detector (given by the geometry), a flux is expected of roughly 3 events per minute. This is empirically confirmed.

We assign a **2% systematic** to the structural difference East/West

Data overview

	Position A	Position B	Average
Run I	4.7 ± 3.26%	-2.0 ± 5.7%	1.35 ± 3.2%
Run II	3.44 ± 3.44%	0.93 ± 3.96%	2.19 ± 2.6%

$$A = \frac{N(\text{West to East}) - N(\text{East to West})}{N(\text{West to East}) + N(\text{East to West})} = A_{\text{raw}} + A_{\text{det}}$$

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Weighted average of the asymmetry

A = 1.80% ± 2.0% (stat) ± 2.0% (syst)

Positive means: more from West to East(?)

0.64σ discovery!

Conclusion & Interpretation

- We do not observe a strong excess, and are compatible with the 0-hypothesis at 0.9σ.
- It might just be that we switched around the cables.

FUNDING REQUESTED FOR ~~FINAL~~ UPGRADE RESEARCH

- The acceptance for West/East is slightly different: structure R&D can improve, or include correction factor.