Discover Cosmic Rays

INTERNATIONAL COSMIC DAY

Licei Einstein Da Vinci - Molfetta
Liceo scientifico Fermi - Bari
Liceo Scientifico "A. Scacchi" -Bari
Liceo Scientifico CAFIERO - Barletta
G. Ferraris - Liceo Osa Montalcini - Molfetta (BA)
Liceo CAGNAZZI classico, scienze umane, economico-sociale - Altamura
Liceo Scientifico "G. Salvemini" - Bari
Liceo Scientifico "E. Amaldi" - Bitetto

November 10 | 2021

INTERNATIONAL COSMIC DAY

Bari, Italy

- Held in the Physics department (INFN, Università, Politecnico)
- 23 students from 8 schools in the Bari area
- Brief lectures on cosmic rays and methods of investigation
- Group work on different aspects of the investigation
- Production of a booklet

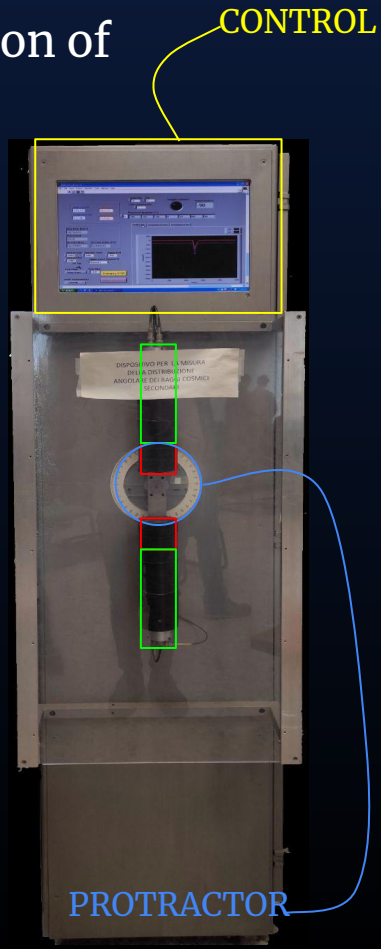
Experimental apparatus: designed for measuring the direction of incoming cosmic rays.

The apparatus is made up of two units.

Each unit contains a scintillator detector and a photomultiplier tube (PMT).

The two units are aligned; this allows us to investigate different angles more accurately, by simply rotating the apparatus. We also use a protractor to know exactly which angle we are investigating.

Lastly, a PC is connected to the apparatus to collect data.



The two scintillators detect cosmic rays coming into the apparatus.

Each time a cosmic ray hits the surface, a small amount of blue light is produced.

To investigate this light better, we use PMTs to turn the fotons into electrons.

This creates a current, which we use to collect an electric signal in order to analyze it.

We then produce graphs to show the count rate in relation to the angle and the charge of the particles detected.

Observations and results

These are the data we gathered from the observation.

$$R(\Theta) = A\cos^2\Theta + B$$

$$A = (3.29 \pm 0.16) \times 10^{-2}\ \text{Hz}\ (\text{err\%} = 4.8\%)$$

$$B = (4.92 \pm 0.77) \times 10^{-3}\ \text{Hz}\ (\text{err\%} = 15.7\%)$$