



UNIVERSITY OF
BIRMINGHAM

SCHOOL OF
PHYSICS AND
ASTRONOMY



INTERNATIONAL COSMIC DAY

Particle Physics Research Group

On 29th November 2018 the Particle Physics Research Group organised participation in the International Cosmic Day (ICD). The event is organised by DESY and involves participation of institutions all around the world. Three local schools arrived at the University on the day, each bringing groups of 8-10 students from years 12 and 13.

The day started with an introductory talk on cosmic rays and continued with students being briefed on how to use the cosmic ray telescopes and the spark chamber for data collection.



The experimental aims of the day were (i) to measure the rate of air shower particles as a function of the zenith angle and (ii) the effect of height on the count rate of cosmic rays. Students collected and analysed data, produced scientific posters on their experiments and finally

discussed their results and conclusions with other schools around the world via a live video-link.

All work was submitted to DESY and an ICD Booklet was created, containing:

- the general announcement poster;
- a picture of the google map showing all participating institutes;
- pages for research topics of all participating institutes;
- pages for results of every participating group;
- summary of results;
- information about school projects, relevant links, interesting websites and further material.

COSMIC RAYS

SOUTH PEMBROKE COLLEGE

Aim:
To investigate the effect of distance between the two glass plates on the number of particles passing through the plates.

Method:
1. Set up the apparatus as shown in the diagram.
2. Measure the distance between the scintillating plates and record it in the table of results.
3. Apply P.D. (5V) to the circuit connected to the scintillating plates, then read the number of marks passing through, shown on the display on the electronic unit. Use a stopwatch to control the time the circuit receives P.D. Record the results in the results table.
4. Repeat step 3 twice more for the first distance, recording results and calculating a mean value.
5. Repeat steps 3 and 4 for at least 3 additional distances.
6. Plot a graph using the data collected.

Hypothesis:
Larger the separation in plates, the smaller the range of angles where the muons will pass through both plates.

Diagram:
A schematic diagram showing two parallel glass plates (scintillating plates) connected to a power supply (5V) and a detector unit. A central vertical line indicates the path of particles.

Graph 1:
A graph plotting the number of particles (Y-axis, 0 to 10) against distance in cm (X-axis, 0 to 10). The data points show a decreasing trend as distance increases.

Graph 2:
A graph plotting the number of particles (Y-axis, 0 to 10) against distance in cm (X-axis, 0 to 10). The data points show a decreasing trend as distance increases.

Conclusion:
Our hypothesis proved to be correct as the graph showed a decreasing trend.

Team:
Elijah Reeves, Aidan Parkhouse, Arman, Hanna Boust Esh, Alisha Zahid, Asma Asif, Liana

ICRD

(International Cosmic ray day)

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Method:
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Distance/cm	No. of counts	Time/s	Count rate	Rate/cm
15	36.2	60	0.603	0.0402
14	16.8	60	0.28	0.0187
16	11.6	60	0.193	0.0124
18	12.0	60	0.20	0.0133
20	4.1	60	0.068	0.0045

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