COSMOS à l'École

Part of « Sciences à l'École » (Science at school)

A partnership with IN2P3, CPPM and CERN

President of the scientific committee :

Antoine Letessier-Selvon (IN2P3)

The « Sciences à l'École » plan

- **Created in 2004**
- **Objectives :**
  - sustain and promote projects of scientific et technical culture in high school
  - promote innovation in teaching, team work
- **Two axes :**
  - National and international contests
  - **Equipment plans**

General schema of the 6 equipment plans

- Partnership with public research or scientific institutions
- Lending of high quality scientific material to teaching institutions
- Selection of candidates by a scientific committee (researchers, teachers and inspectors)
- Internships for teachers

A national network

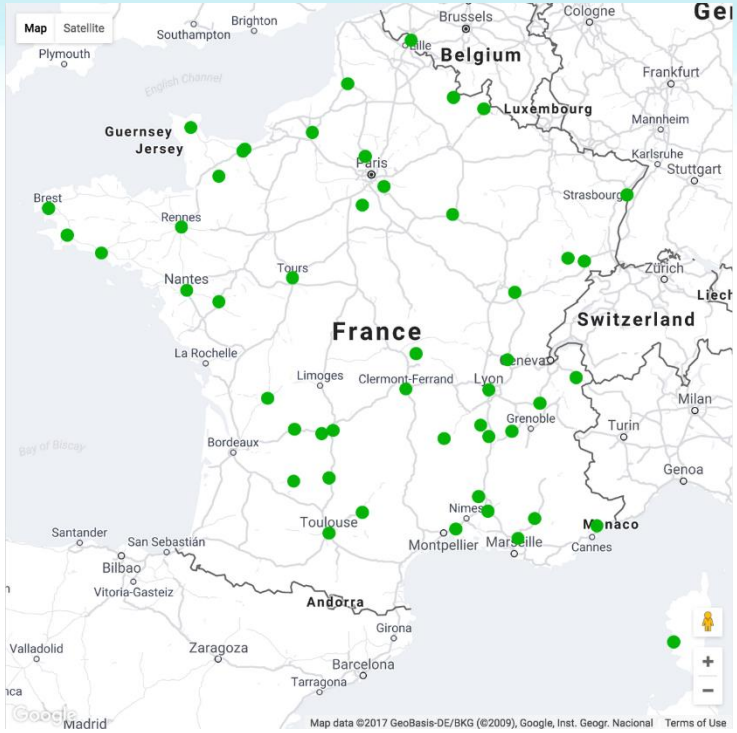
- Information sharing via a mailing list
- Various documents on our web site
- Hardware sharing between nearby high schools

The « COSMOS à l'École » network

- 45 equipments
- 1900 concerned pupils

- Plan created in 2009
- Last bought hardware in 2017

(15 additional equipments)



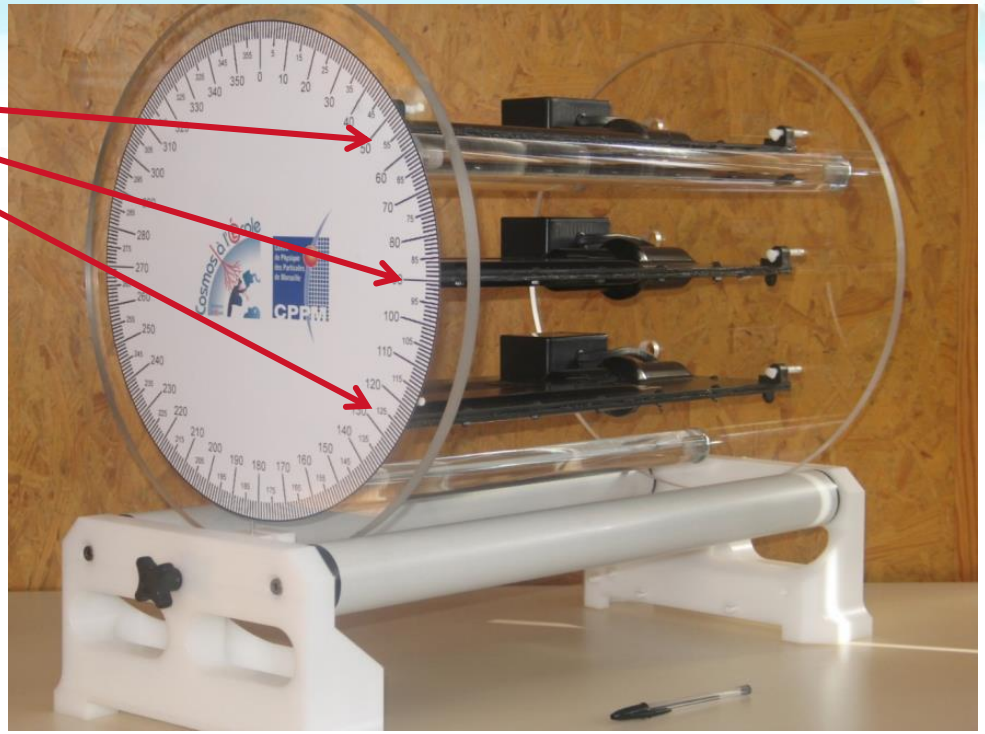
REUNION

The cosmodetector – « cosmic wheel »

It contains 3 plates,

The cosmodetector – « cosmic wheel »

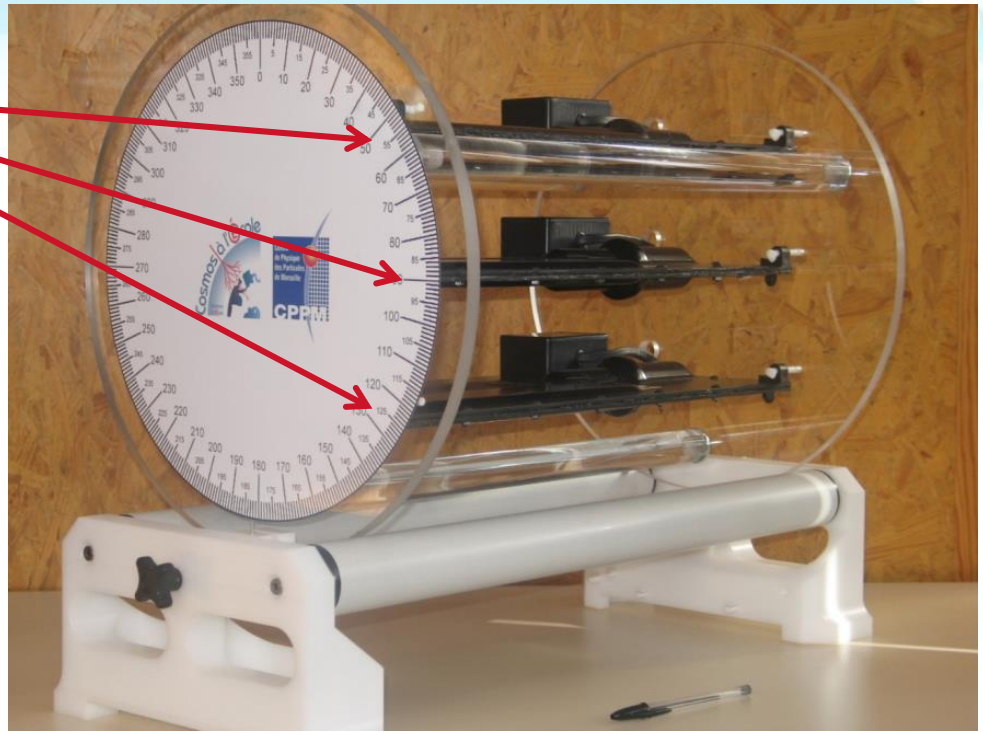
It contains 3 plates,



The cosmodetector – « cosmic wheel »

It contains 3 plates, each containing :

- a scintillator detecting muons
- a photomultiplier



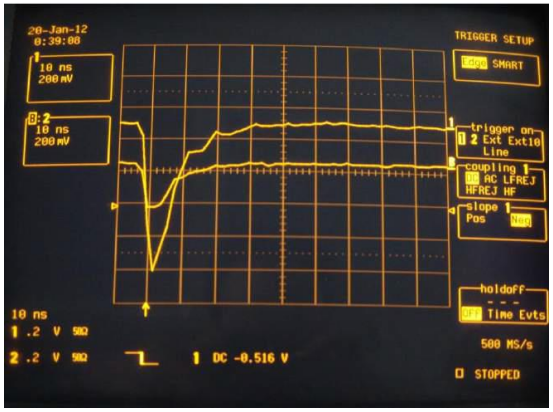
The cosmodetector – « cosmic wheel »

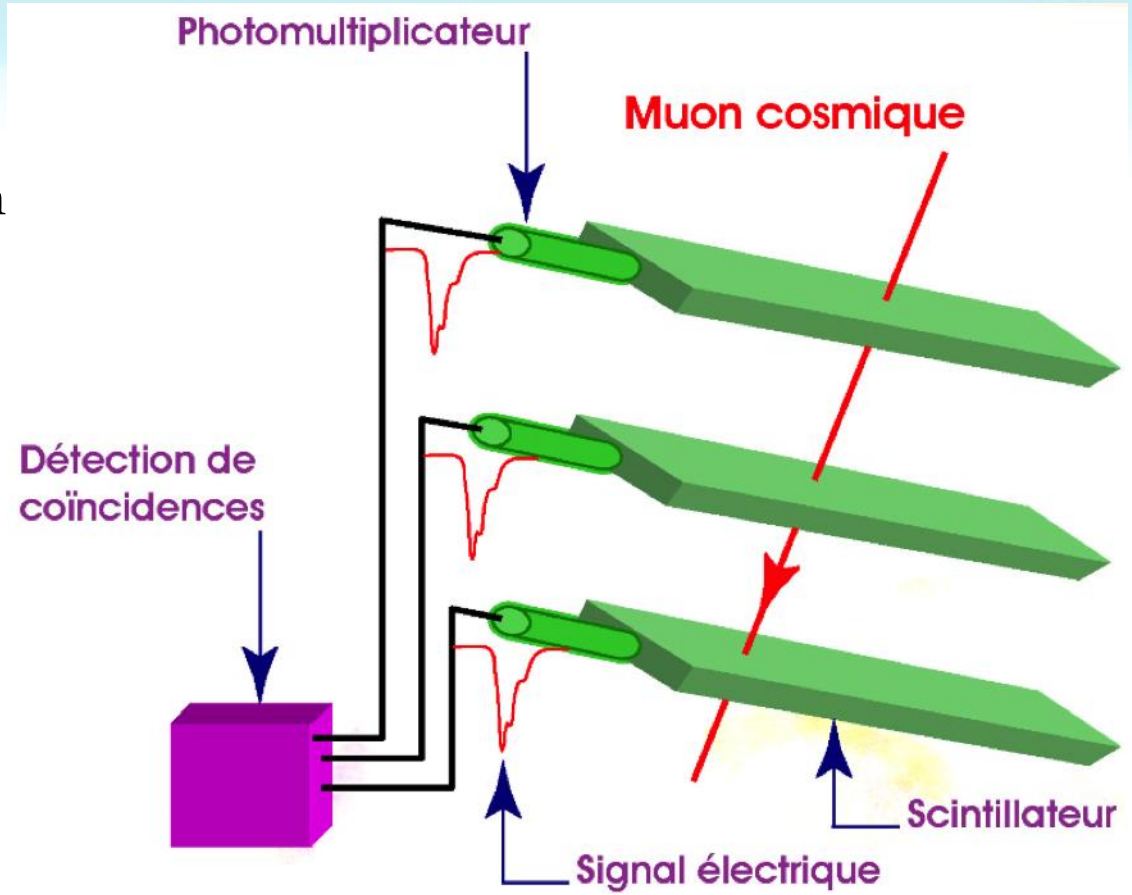
- Acquisition program of calibrated data
- Two additional scintillators for Cerenkov effect and muon lifetime

Coincidence detection

A muon goes through the three scintillators

→ synchronised detection on the 3 photomultipliers, discrimination criterium for true events



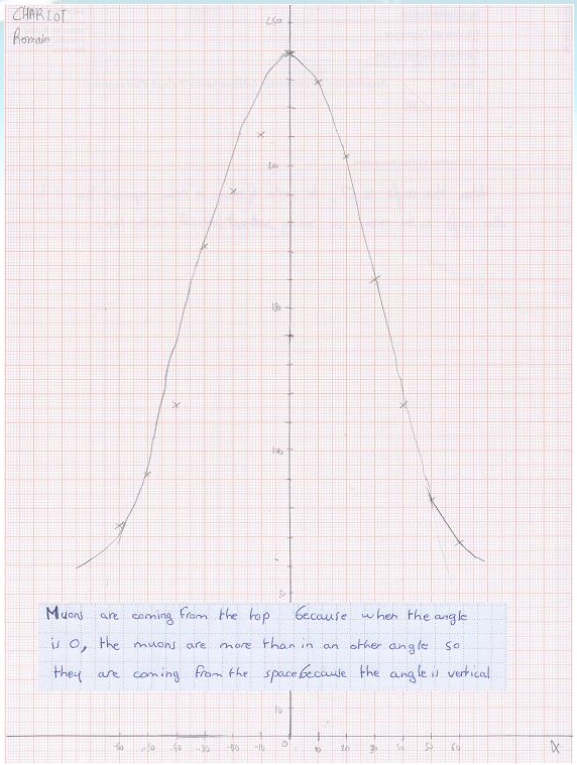


Influence factors

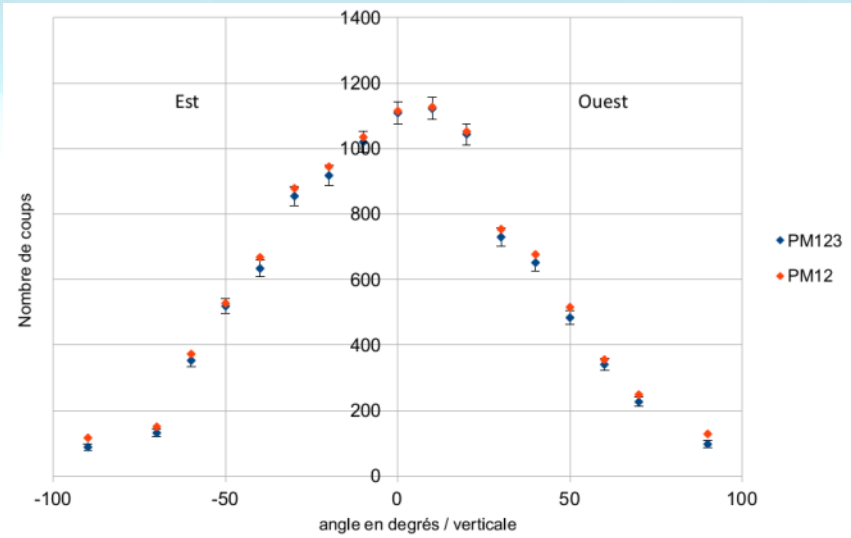
Anything which can alter the particle flux :

- Walls
- Wheel orientation
- Altitude
- Ambiant radioactivity
- (latitude)

Example of pedagogical activities : direction of observation



Measurement of incident direction of muons



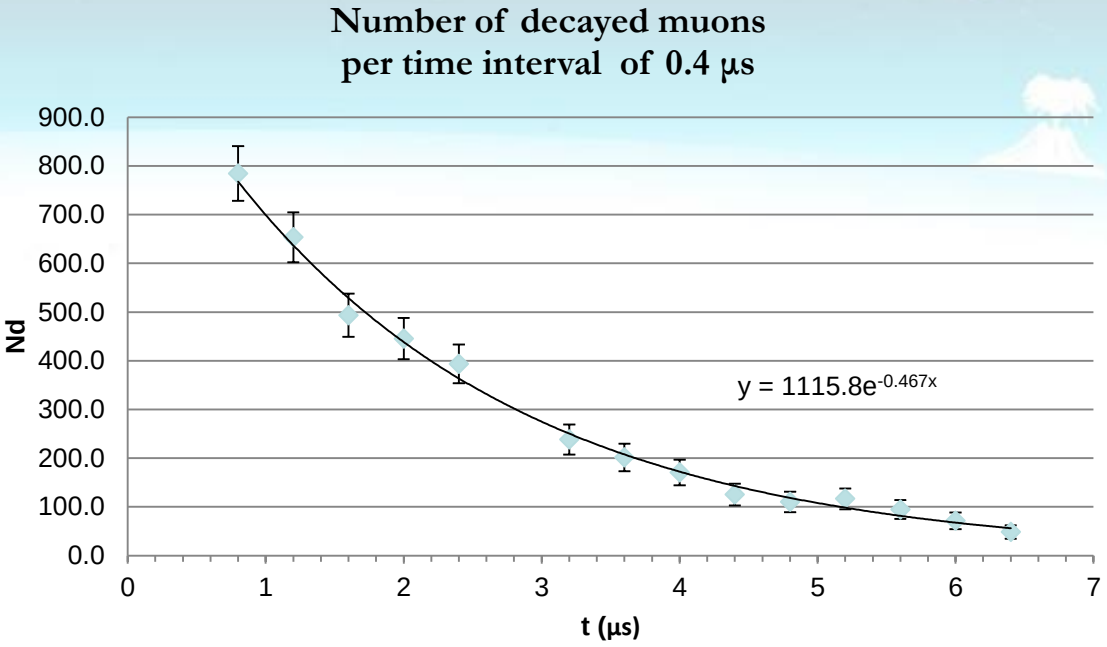
Observation of dissymmetry due to a nearby building

Lycée Follereau, Besançon

Example of pedagogical activities : muon lifetime

Activity developed by the teacher for pupils including :

- The apparatus
- Data taking
- Measurement uncertainties
- Modelisation
- Measurement of proper time and its interpretation in Special Relativity



Example of pedagogical activities : collaborative measurement – Fête de la Science

- 20 participating cosmodetectors
- common protocol, same date
- data sharing

→ Occasion to exchange ideas with colleagues, to motivate pupils

→ Preparation for the International Cosmic Day

+ La Réunion

Ressources

For EVERY teacher

- Access to pedagogical ressources from our scientific partners and some teachers of the network :

http://www.sciencesalecole.org/plan-cosmos-a-lecole-ressources-pedagiques-ressources-scientifiques/

- CERN's French Teacher Programme (co-organized with IN2P3) each year in October.

Sciences à l'École

Thank you for your attention

Any questions ?

Sciences à l'École