



Société Française
de Physique



Antimatter in high schools



Outreach, Education & Diversity - 396

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Context / Objective



600 attendees
in Grenoble

Visit high schools with an e^+e^- annihilation experiment

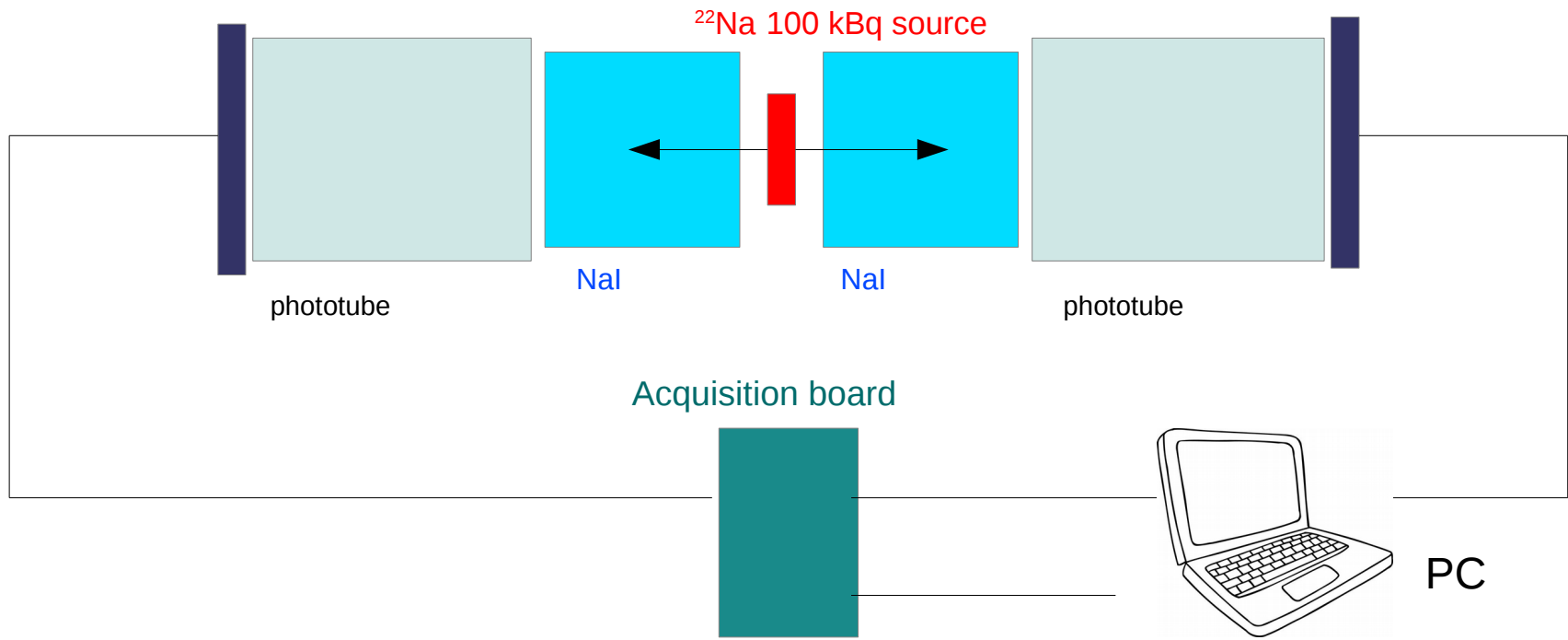
Reach students wherever they live (distant sites)

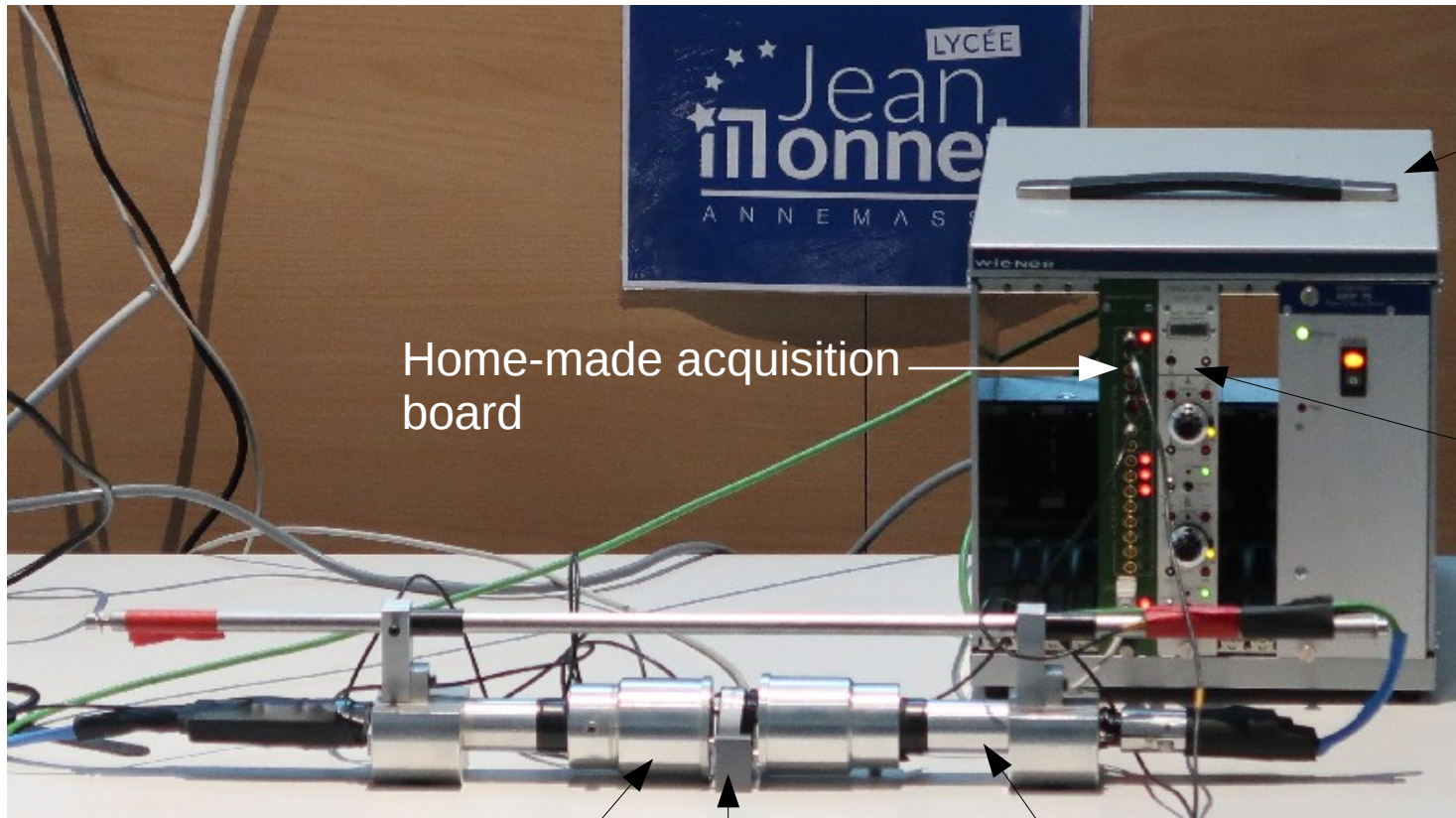
Easier/cheaper to move a teacher rather than 50 students

A lesson delivered in a standard high school time slot : 50 min



Experiment





5 slot
NIM
crate

Home-made acquisition
board

HV
power
supply

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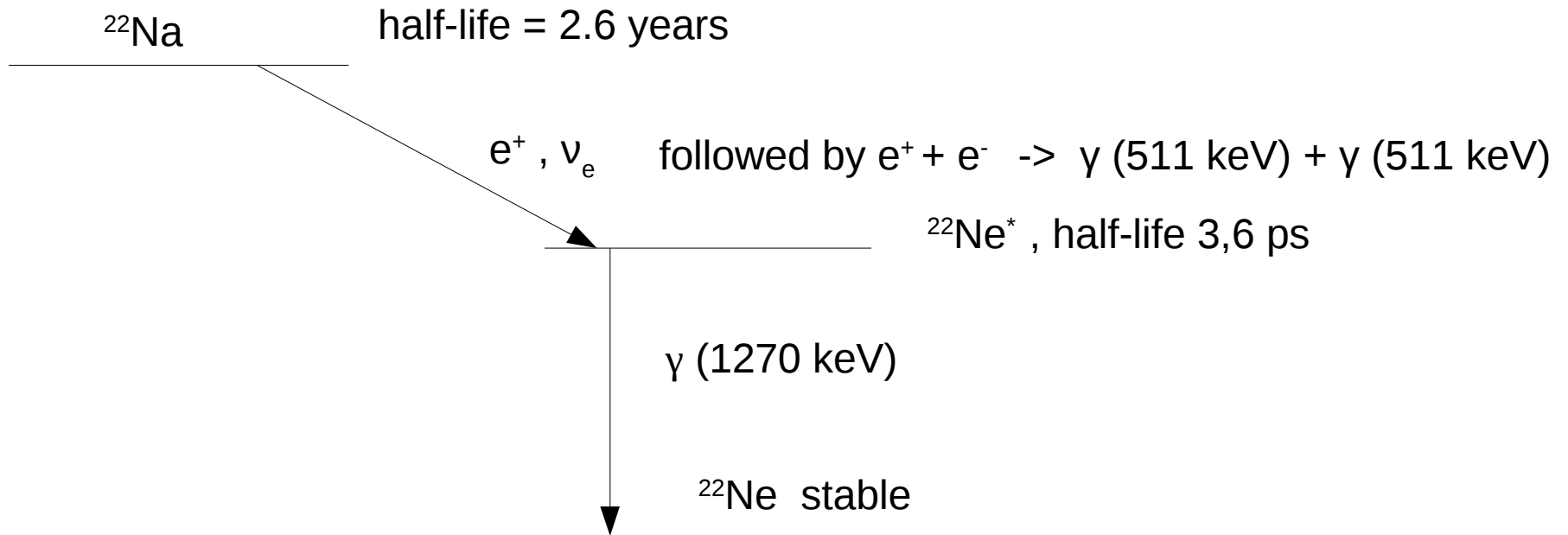
NaI

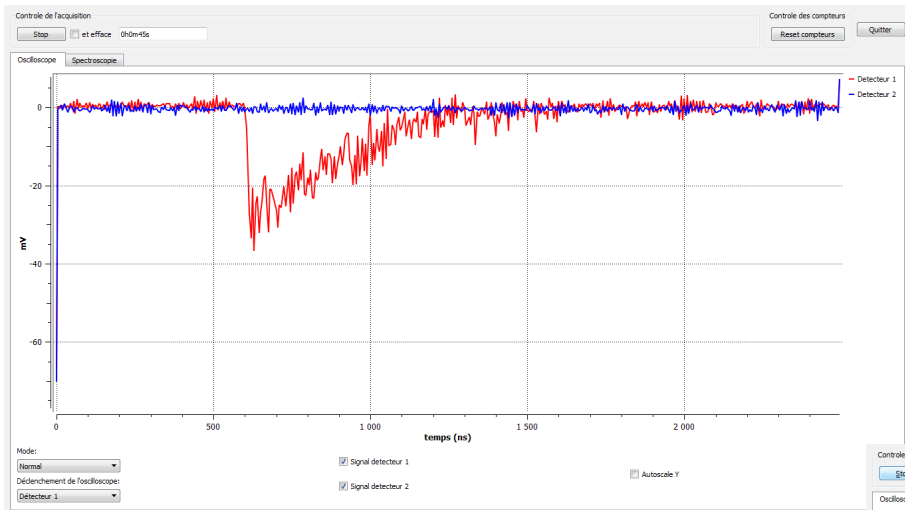
Source

Phototube

Installed in 15 minutes
weight : 5 kg dominated by NIM crate

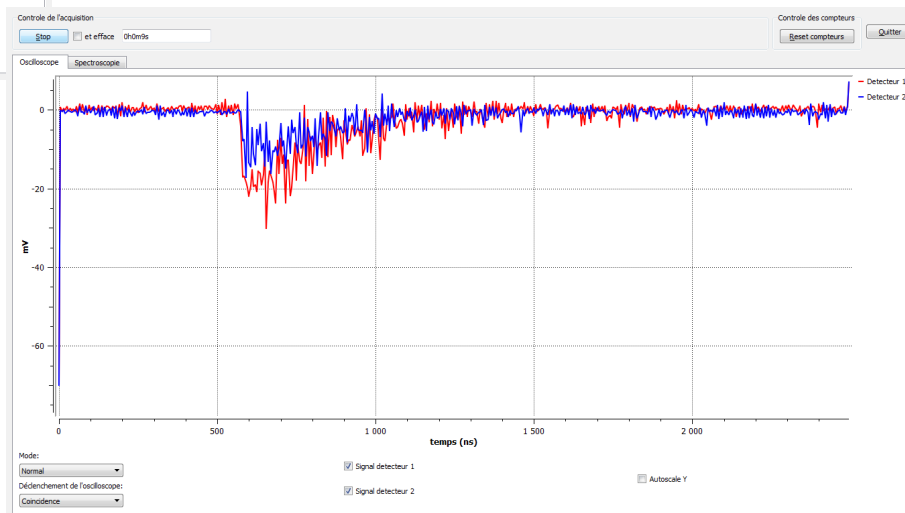
^{22}Na decay diagram





Single

In coincidence



Contrôle de l'acquisition

Stop

et efface

0h0m35s

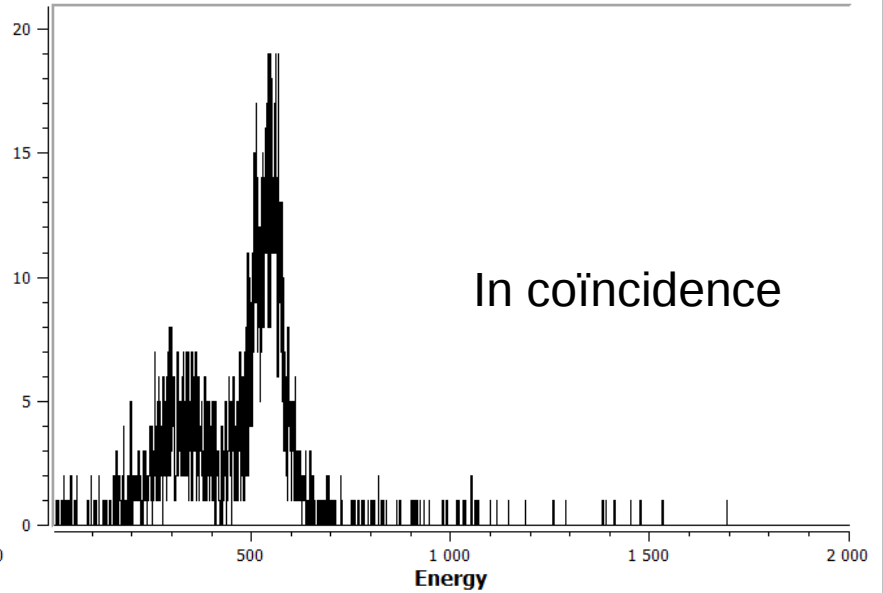
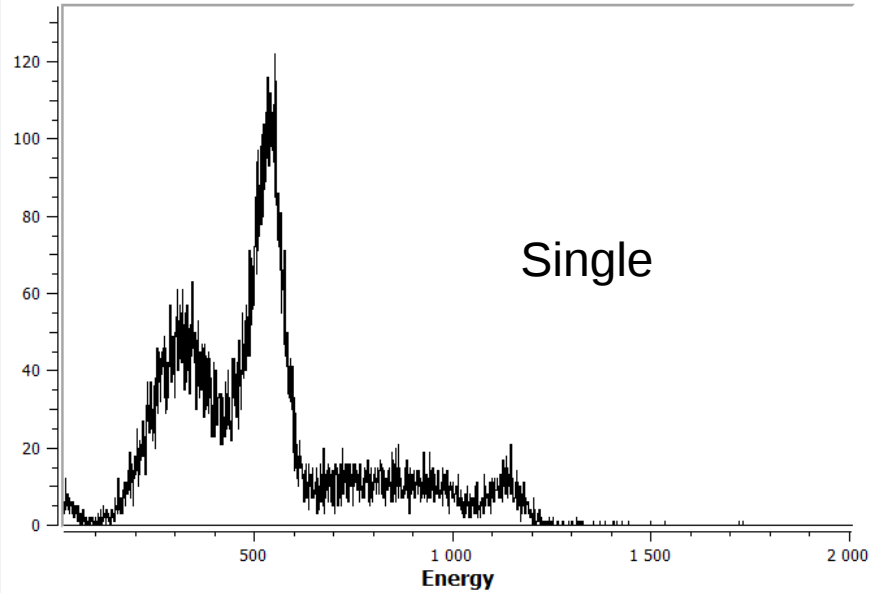
Contrôle des compteurs

Reset compteurs

Quitter

Oscilloscope

Spectroscopie



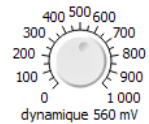
Contrôle

Clear

26634

Déclenchement:

Détecteur 1



Dynamique d'entree

560,00 mV

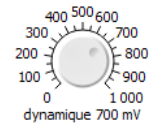
Contrôle

Clear

2742

Déclenchement:

Coincidence



Dynamique d'entree

700,00 mV

Pedagogy

Notions that can be touched upon

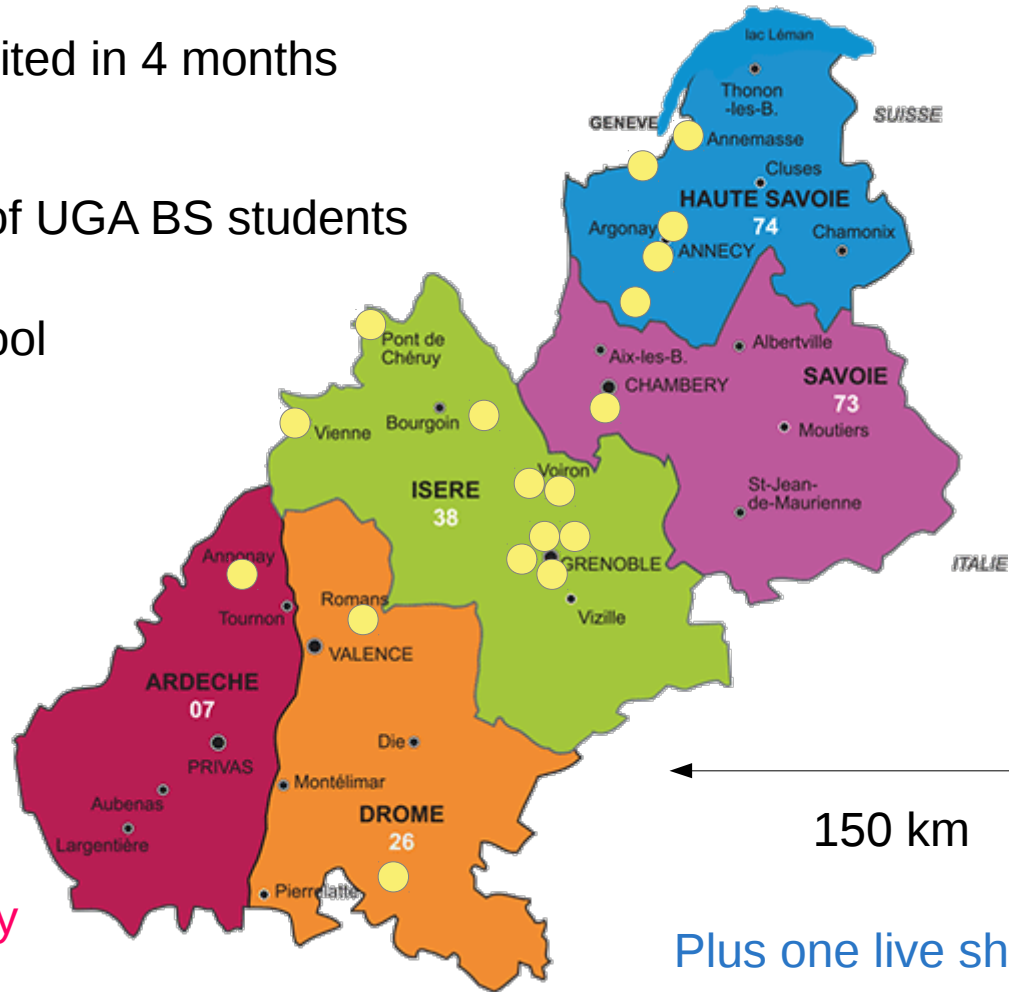
- History of science
- Kinematics
- Radioactivity
- Relativity
- Quantum mechanics
- Cosmology
- Fundamental symmetries
- Instrumentation
- Interaction of particles with matter
- Positron Emission Tomography

Audience

18 high schools visited in 4 months
~ 1200 students

One class in front of UGA BS students

● Visited high school



Grenoble regional
educational authority
territory

Plus one live show on local TV !

Pictures



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Conclusion & prospects

- Ideal pedagogical vehicle to bring nuclear & particle setup to high schools, while matching the physics program
- Boost the reach of students living in remote areas
- Met high success everywhere : students are interested by modern science !

- Extend classes to other French regions next year
- Produce events & prepare analysis classes : reconstruction, calibration, cuts, fits