

Neutrinos in the classroom
Neutrinos en el aula de clase
Lessons learned

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May 15 2017

Neutrinos en el aula de clase

- “**Neutrinos en el aula de clase**” is a web page that was translated from English to Spanish to promote the high energy physics research area into high school students in different institutions through latin america. Our main goal is that students in different countries will be able to increase their knowledge in this research area in an dynamic and interactive way
- The original version (<http://neutrino-classroom.org>) was developed by professors and researchers from the University of Rochester, the University of Minnesota at Duluth and the University of Otterbein, and the project was sponsored by National Science Foundation (NSF). We have updated the design of the web page for the Spanish version keeping intact the content from the original (english) version.

Spanish version: Webpage design, edition and translation:

Translation: Luis Echeverry and Denis Torres.

Edition (in process): Ph.D David Martinez , Ph.D. Jose Palomino (Stony Brook University)

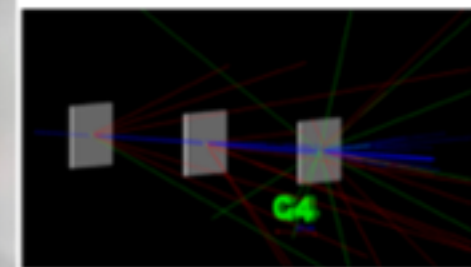
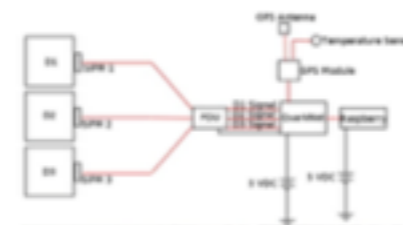
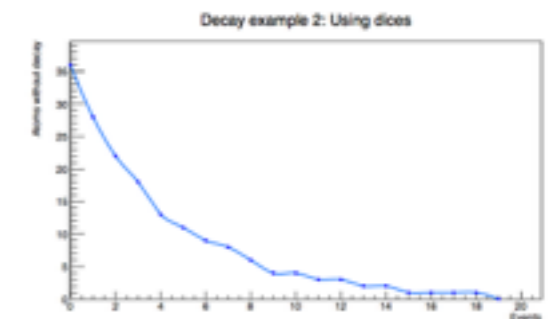
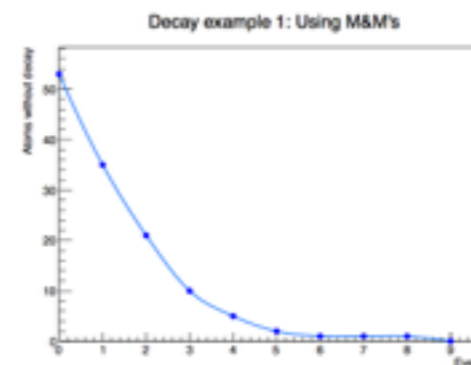
Design: Alejandra Coral - Undergraduate student (Universidad de Nariño)

What we have done with the tool? South America

- We organized the first “**2 day workshop**” in latin america, in the city of Pasto (Colombia). We selected a total of 36 highly motivated and outstanding high school students from different institutions.



Day 1	Day 2
Introduction 1: Familiarization about particle physics, particle interactions and quick intro to Fermilab.	Introduction 2: Familiarization with the Arachne event display. Quick explanation of energy conservation, particle momentum.
Radioactive decay using dices.	Muon decay using Arachne event display.
Coffee break	Coffee break
Radioactive decay using M&M chocolates.	Muon lifetime using Arachne event display
Hardware exercise: Experimental demonstration of a particle detector using one previously donated from THE ESCARAMUJO PROJECT (http://en.escaramujo.net/p/blog-page.html). GEANT4 simulation for the particle detector.	Energy in a particle decay.



What we have done with the tool? USA

- Von Steuben High school (Chicago) ~23 students.
- Two day workshop -> First day activities of radioactive decay using M&M and dices -> Location: IIT (Chicago)
- Team: Roger G. (UFSM), Jose B. (PUCP) David M (IIT). Logistics: Megan C. (IIT) and Maggie Garcia (IIT)
- Second day: Arrange visit to Fermilab, tours at **MicroBooNE** and **MINERvA** experiments!



What do we envision for the near future?

- Continue contributing with our gained “field” experience in the new projects for the coming neutrino masterclass!
- We have received excellent feedback from the young people in our workshops in USA and Colombia. We want to work closely with them to improve the reception of the future international neutrino masterclass.
- We are really interested (and volunteer :)) to led the translation to Spanish (if necessary) of materials of the coming neutrino masterclass.
- Once the neutrino masterclass is ready, we will be glad to led the “testing” of the material with high school students here in US and in Latin america.

Thanks for the attention!
Gracias por su atención!