



Contribution ID : 837

Type : Oral presentation

CERN@school: bringing CERN into the classroom

Thursday, 3 July 2014 11:15 (15)

CERN@school [1] brings technology from CERN [2] into the classroom to aid with the teaching of particle physics. It also aims to inspire the next generation of physicists and engineers by giving participants the opportunity to be part of a national collaboration of students, teachers and academics, analysing data obtained from detectors based on the ground and in space to make new, curiosity-driven discoveries at school. CERN@school is based around the Timepix hybrid silicon pixel detector [3] developed by the Medipix Collaboration [4], which features a 300 μm thick silicon sensor bump-bonded to a Timepix readout ASIC. This defines a 256 \times 256 grid of pixels with pitch 55 μm , the data from which can be used to visualise ionizing radiation in a very accessible way.

Broadly speaking, CERN@school consists of a web portal that allows access to data collected by the Langton Ultimate Cosmic ray Intensity Detector (LUCID) experiment [5] in space and the student-operated Timepix detectors on the ground; a number of Timepix detector kits for ground-based experiments, to be made available to schools for both teaching and research purposes; and educational resources for teachers to use with LUCID data and detector kits in the classroom.

By providing access to cutting-edge research equipment, raw data from ground and space-based experiments, CERN@school hopes to provide the foundation for a programme that meets the many of the aims and objectives of CERN and the project's supporting academic and industrial partners. The work presented here will provide an update on the current status of the programme as supported by the UK's Science and Technology Facilities Council (STFC) and Royal Commission for the Exhibition of 1851. This includes recent results from work with the UK's GridPP Collaboration [6] on using grid resources with schools to run GEANT4 [7] simulations of CERN@school experiments and integration with ArcGIS mapping software [8] to combine Timepix data with geographical information. Plans for expansion to other CERN member states will also be discussed.

[1] <http://cernatschool.web.cern.ch>

[2] <http://cern.ch>

[3] X. Llopart et al., Nucl. Instr. Meth. A 581 (2007) 485-494

[4] <http://medipix.web.cern.ch/>

[5] L. Pinsky et al., Radiation Measurements 46 (2011) 1610-1614

[6] <http://www.gridpp.ac.uk>

[7] A. Agostinelli et al., Nucl. Instr. Meth. A 506 (2003) 250-303

[8] <https://www.arcgis.com>

Summary

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Session Classification : Education and Outreach

Track Classification : Education and Outreach