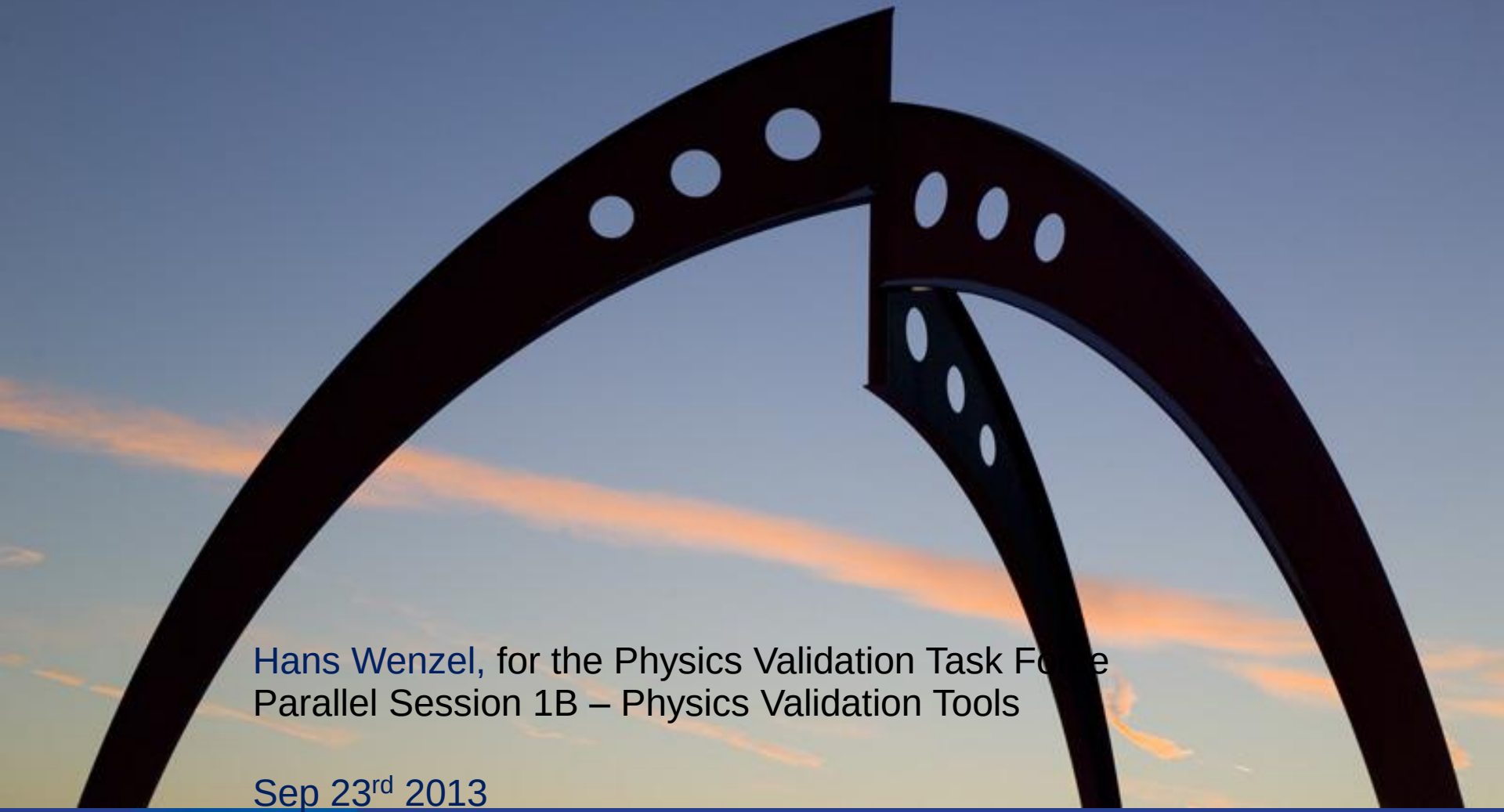
FNAL Validation DB status



Hans Wenzel, for the Physics Validation Task Force

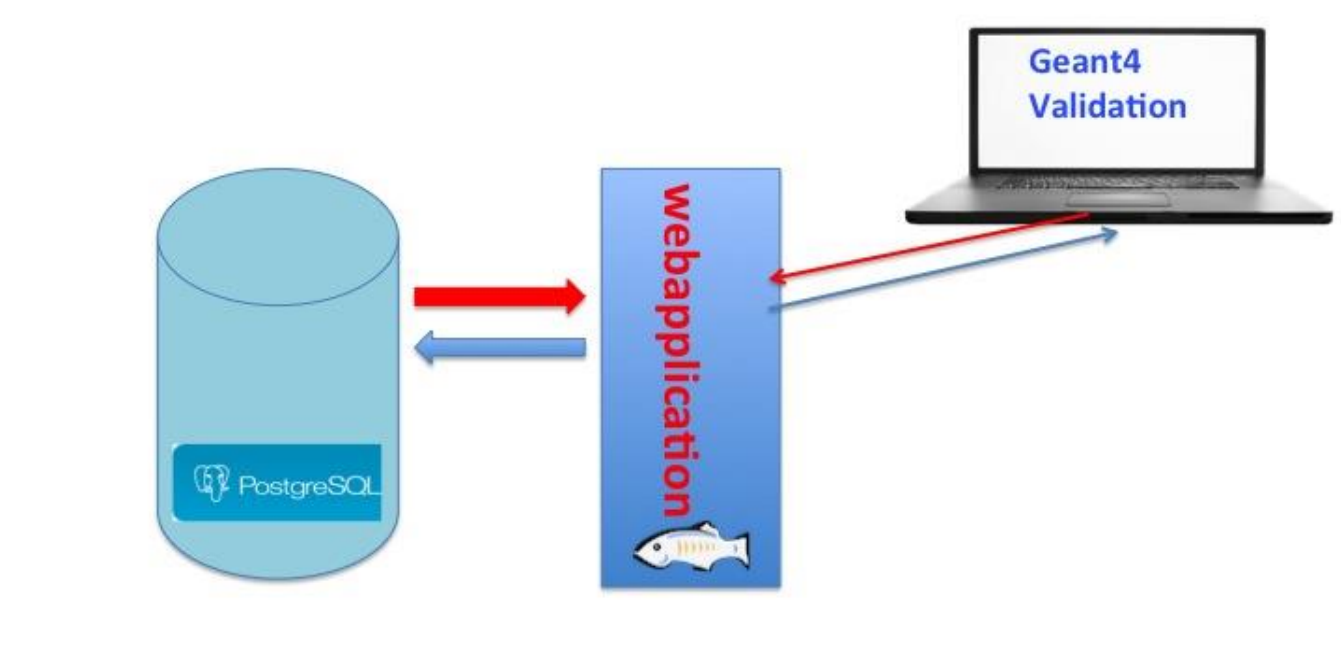
Parallel Session 1B – Physics Validation Tools

Sep 23rd 2013

Apologies

This presentation contains as the one in Plenary Session 2 – earlier. So let's go though it very fast And have some discussions.

Introduction



Central repository (Database) of tests, where a test is a comparison of experimental data with simulation.
Test are stored as plots with metadata in the data base. The web application allows to View the tests.
Providing/uploading the test results is responsibility of the model developers.

Project info

Web page:

http://g4validation.fnal.gov:8080/G4ValidationWebApp/

Code in SVN
https://svnweb.cern.ch/cern/wsvn/g4validation/trunk/G4ValidationWebApp/

Validation Taskforce TWIKI/Task list:
https://twiki.cern.ch/twiki/bin/view/Geant4/PhysicsValidationTaskForce

https://twiki.cern.ch/twiki/bin/view/Geant4/ValidationTasks

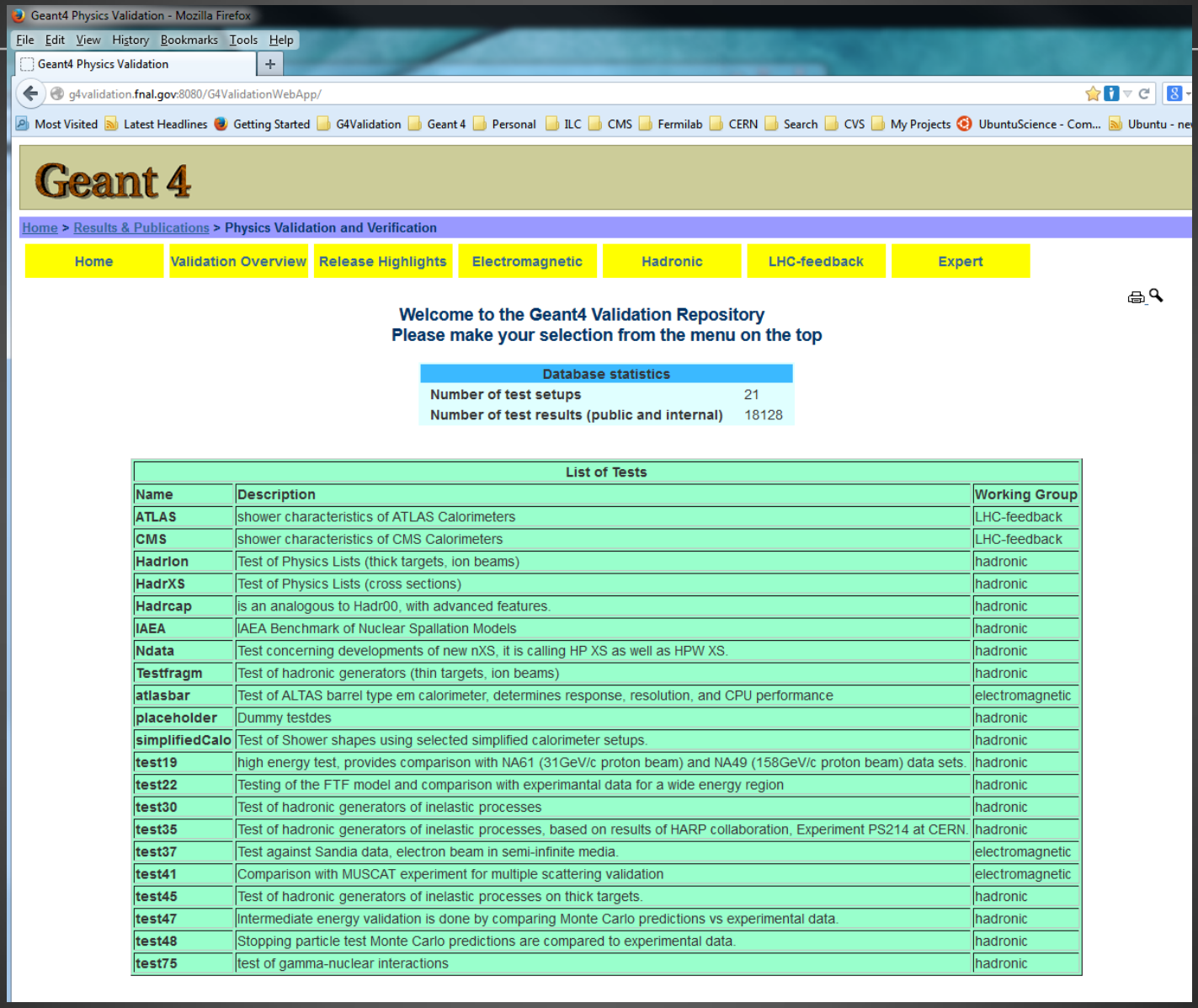
https://svnweb.cern.ch/trac/g4validation/

Production environment

- **web Application server on VM on Fermi Cloud, postgresql database operated by fermilab database group.**

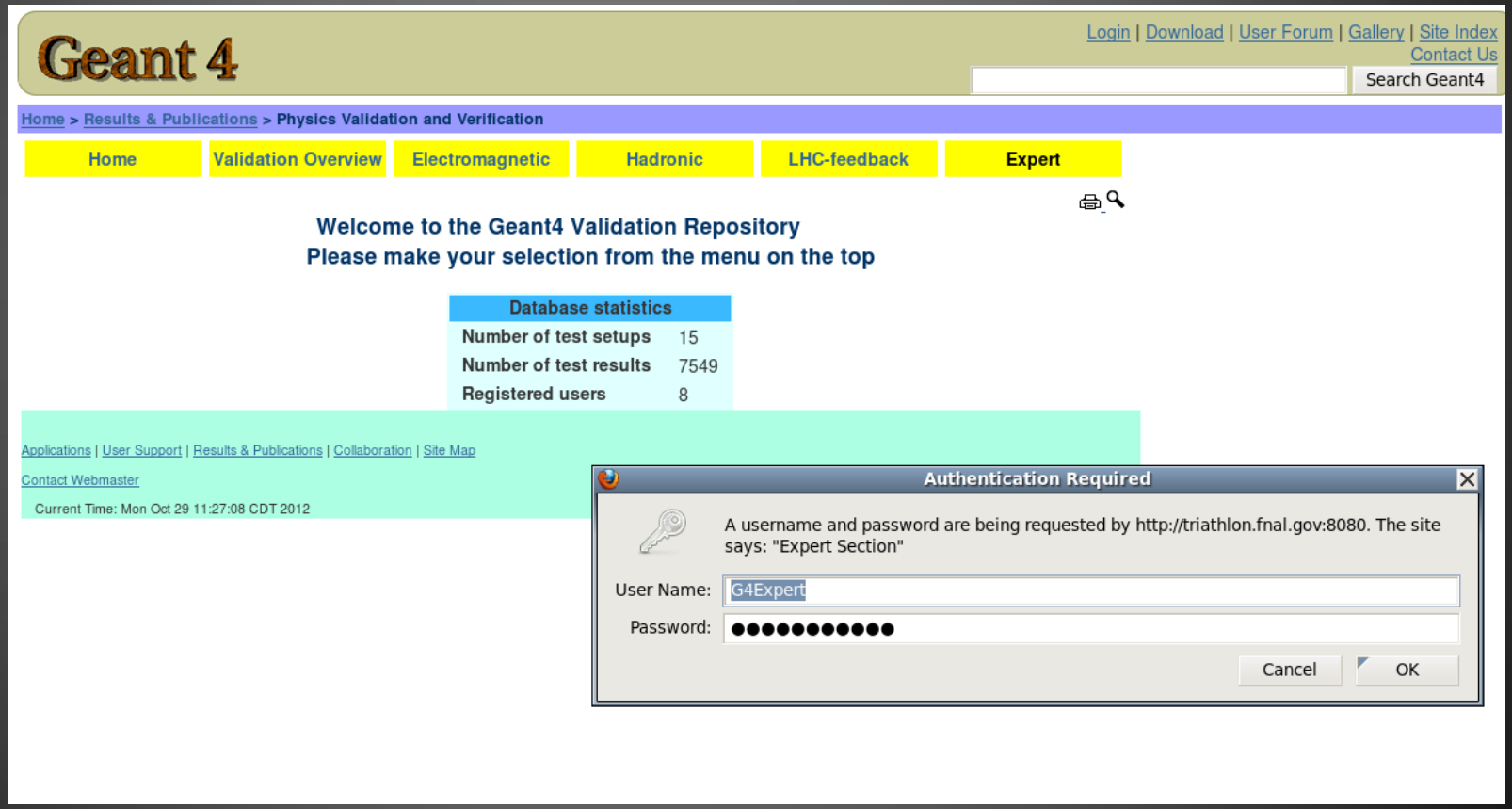
http://g4validation.fnal.gov:8080/G4ValidationWebApp/

- **Up to date: latest java/java libraries, glassfish web application server, database schema identical to development environment.**
- **New features include:**
  - **Multiple (single) File Upload web application. Help available to guide you through the process.**
  - **Release highlights for upcoming Geant4 release (Julia)**
  - **Only tests explicitly declared public can be viewed without authentication.**
  - **Expert login to view, edit, delete tests. (Makes use of functionality provided by glassfish web application server).**


Geant4 Physics Validation - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Geant4 Physics Validation
g4validation.fnal.gov:8080/G4ValidationWebApp/
Most Visited Latest Headlines Getting Started G4Validation Geant 4 Personal ILC CMS Fermilab CERN Search CVS My Projects UbuntuScience - Com... Ubuntu - ne
Geant 4
Home > Results & Publications > Physics Validation and Verification
Home Validation Overview Release Highlights Electromagnetic Hadronic LHC-feedback Expert
Welcome to the Geant4 Validation Repository
Please make your selection from the menu on the top
Database statistics
Number of test setups 21
Number of test results (public and internal) 18128
List of Tests
Name Description Working Group
ATLAS shower characteristics of ATLAS Calorimeters LHC-feedback
CMS shower characteristics of CMS Calorimeters LHC-feedback
HadrIon Test of Physics Lists (thick targets, ion beams) hadronic
HadrXS Test of Physics Lists (cross sections) hadronic
Hadrcap is an analogous to Hadr00, with advanced features. hadronic
IAEA IAEA Benchmark of Nuclear Spallation Models hadronic
Ndata Test concerning developments of new nXS, it is calling HP XS as well as HPW XS. hadronic
Testfragm Test of hadronic generators (thin targets, ion beams) hadronic
atlasbar Test of ALTAS barrel type em calorimeter, determines response, resolution, and CPU performance electromagnetic
placeholder Dummy testdes hadronic
simplifiedCalo Test of Shower shapes using selected simplified calorimeter setups. hadronic
test19 high energy test, provides comparison with NA61 (31GeV/c proton beam) and NA49 (158GeV/c proton beam) data sets. hadronic
test22 Testing of the FTF model and comparison with experimantal data for a wide energy region hadronic
test30 Test of hadronic generators of inelastic processes hadronic
test35 Test of hadronic generators of inelastic processes, based on results of HARP collaboration, Experiment PS214 at CERN. hadronic
test37 Test against Sandia data, electron beam in semi-infinite media. electromagnetic
test41 Comparison with MUSCAT experiment for multiple scattering validation electromagnetic
test45 Test of hadronic generators of inelastic processes on thick targets. hadronic
test47 Intermediate energy validation is done by comparing Monte Carlo predictions vs experimental data. hadronic
test48 Stopping particle test Monte Carlo predictions are compared to experimental data. hadronic
test75 test of gamma-nuclear interactions hadronic

Example: Uploading multiple tests

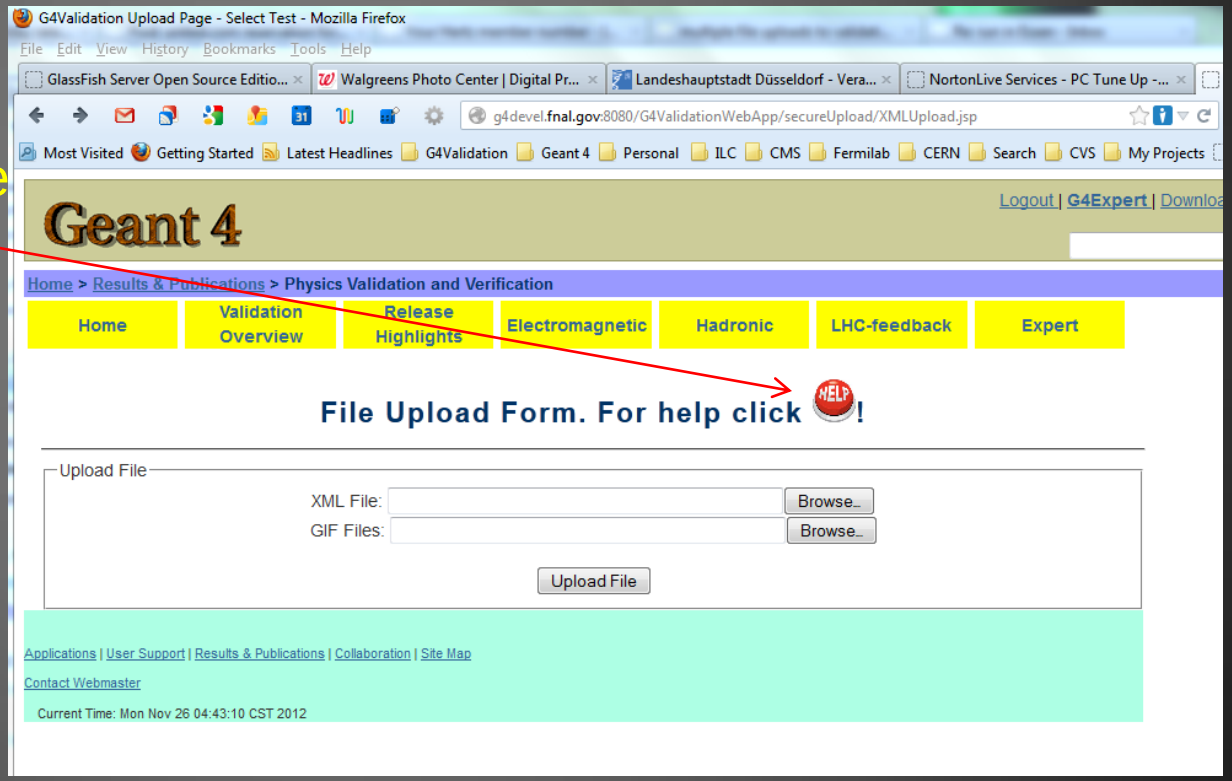
First login to expert page then select Upload Tests (multiple)



Example: Uploading multiple tests (cont.)

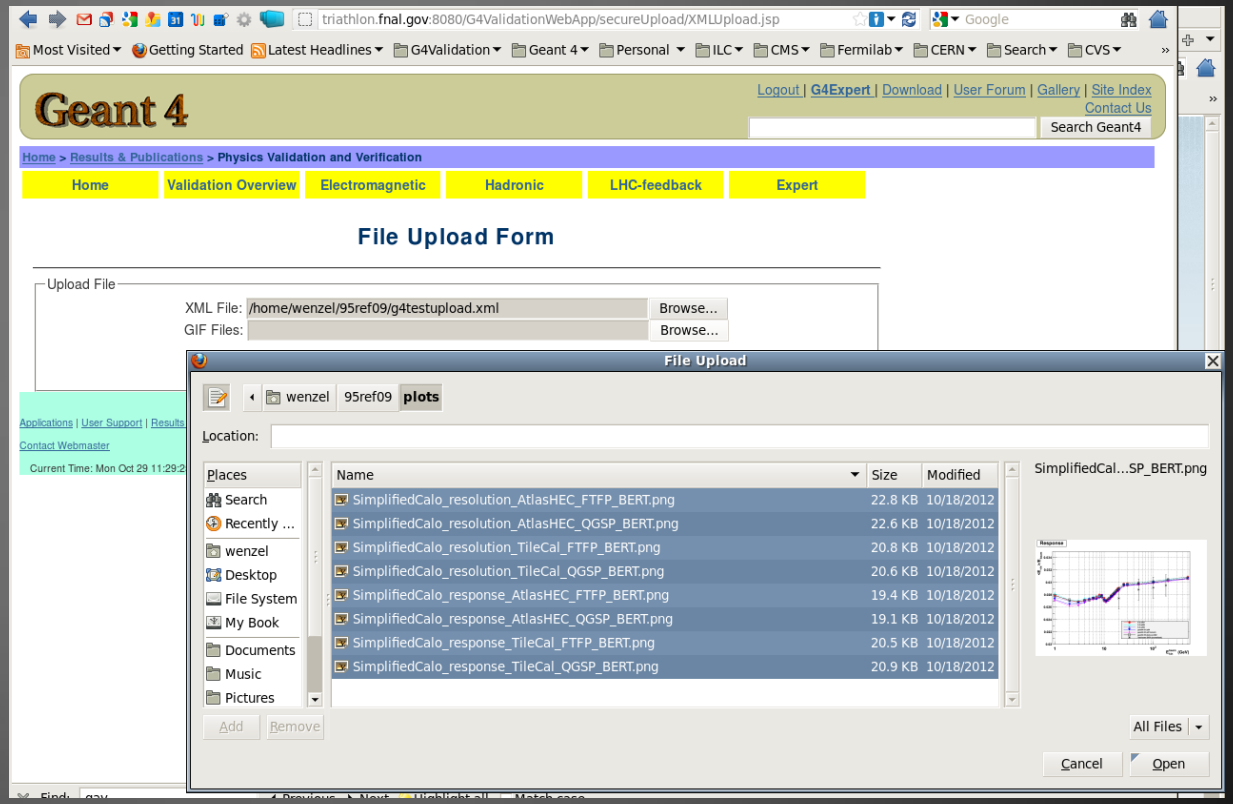
Press Help button for:

- detailed instructions
- Example xml file describing the multiple file upload the



Example: Uploading multiple tests (cont.)

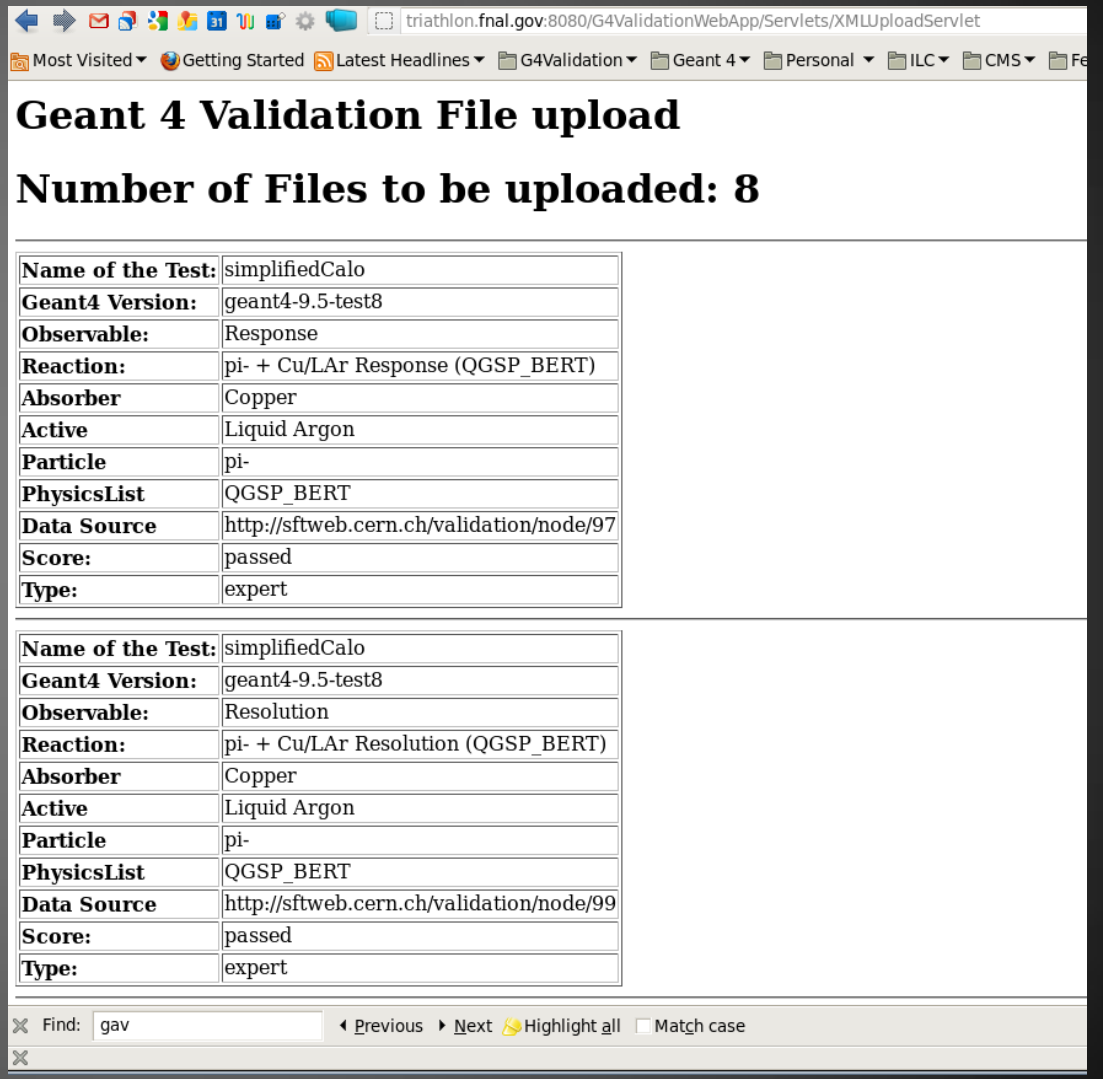
- Select the xml file describing the tests
- Select all the images that need to be uploaded



Example: Uploading multiple tests (cont.)

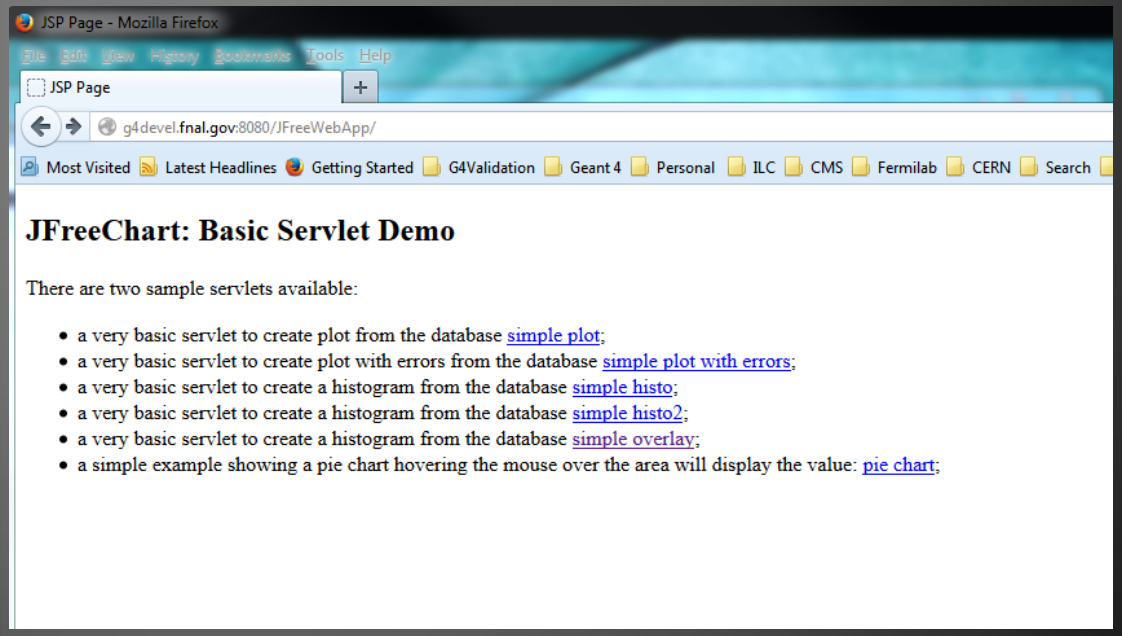
This is what a successful upload should look like. Problems usually arise from malformed xml files which can be avoided by:

- Use of xml enabled editor
- Templates for different tests (usually only geant 4 version changes for a given test)



Development/Test environment

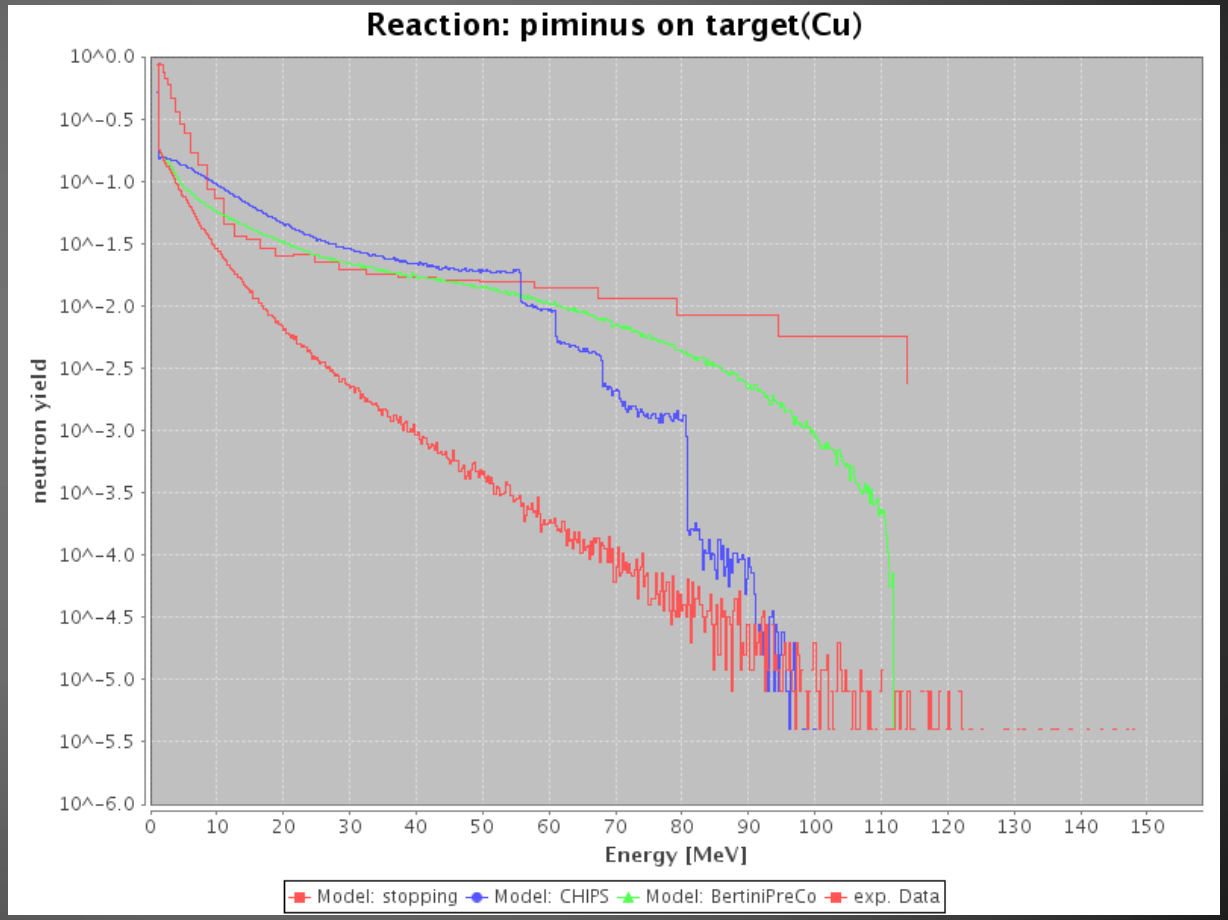
- **Development web Application server on Fermi Cloud/ development data base, used to test features/configurations then will be rolled over to production server .** http://g4devel.fnal.gov:8080/G4ValidationWebApp/
- **Also hosts prototype 'plots on the fly' web application:**http://g4devel.fnal.gov:8080/JFreeWebApp



Graphs on the fly prototype

- Data base schema extended to store raw experimental and raw simulation data (histograms) in the data base.
- Select → plot and overlay (comparable) data, using the jfreechart graphics package.
- Example test48 data provided by Julia:
  - Reaction: pi on Target (Cu, Al, O, N, C, Pb, Ta)
  - Observable: neutron yield
  - Geant 4 version: (need to look up)
  - Models: stopping, Chips, Bertini PreCo
  - Experimental data: Madey et al.

Graphs on the fly example created by prototype web application



What's next

- Work and extend the existing task list.
- Develop prototype web application that allows to select experimental and simulation data and then overlays the data in a plot.
- Import all the experimental data files used by various tests.
- Evaluate web frameworks like PrimeFaces to provide scalability and modern look and feel.
- Actually it is a fun project for e.g. computer science students to learn about web application frameworks, javaEE etc.