

G4Validation: Status and plans

Geant4 Collaboration Meeting at SLAC
September 19th - 23rd, 2011

Hans Wenzel

Fermilab 

20th September 2011

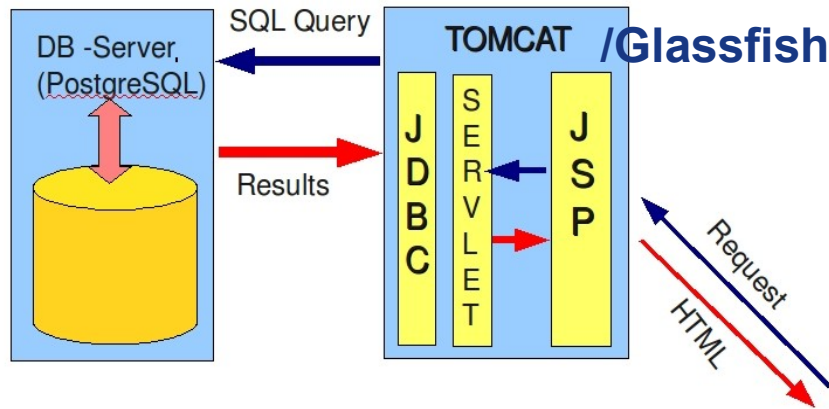
Developers:

Jennifer Karkoska
Andreas Schaelicke
Hans Wenzel
Julia Yarba

Outline:

- Introduction
- Status
- Plans

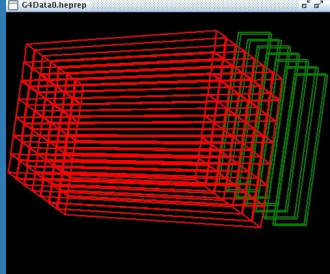
Introduction



G4Validation consists of:

- database containing:
 - Images, tags, descriptions and references to experimental data
- Web Application on Tomcat or glassfish:
 - To display the data
 - To allow experts to upload, edit, delete
- multiple file upload Application.

Homepage



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http://g4jsp.ifh.de:8080/G4HadronicValidation/

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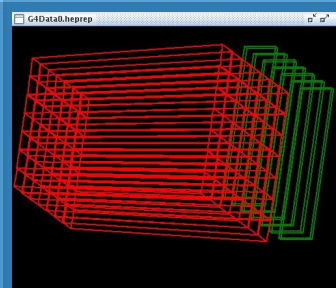
Welcome to the Geant4 Validation Repository
Please make your selection from the menu on the top

| Database statistics | |
|------------------------|------|
| Number of test setups | 15 |
| Number of test results | 7301 |
| Registered users | 8 |

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Hadronic validation



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Welcome to the Geant4 Validation Repository.
Within each test, results may be grouped by certain criteria.
Please make your selection, if applicable, from the menu on the right.

List of hadronic Tests

- Hadrcap
- Ndata
- Test301aea
- placeholder
- simplifiedCalo
- test30
- test35
- test45
- test47
- 9.2.ref08
- 9.4.ref00
- 9.4.ref01
- 9.4.ref02
- geant4-9.2.ref08
- geant4-9.3.ref09
- hadr-cascade-V09-03-66
- test48

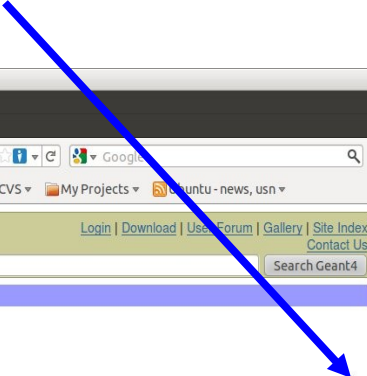
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Display a test

Search Button



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http://g4jsp.ifh.de:8080/G4HadronicValidation/G4ValHAD.jsp?TID=50

Geant 4

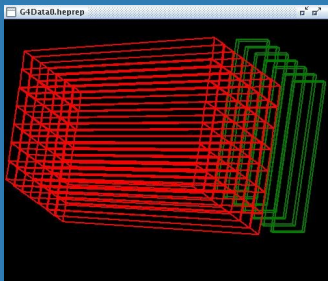
Home | Validation Overview | Electromagnetic | Hadronic | LHC-feedback | Expert

| | |
|--------------------------|---|
| Name of the Test: | test47 |
| Responsible: | Sunanda Banerjee, J. Yarba (Fermilab) |
| Description: | Intermediate energy validation is done by comparing Monte Carlo predictions vs experimental data. |

| | |
|------------------------|-------------------------------|
| Geant4 Version: | 9.2.ref08 |
| Observable: | Inclusive KE distribution |
| Reaction: | $\pi^+ + u \rightarrow p + X$ |

| Test Conditions | |
|-------------------------|--|
| Name | Description |
| last-modified | 2011-06-09 10:44:01 CDT |
| Target | Uranium |
| Particle | π^+ |
| Energy | 5.0 GeV/c |
| Bertini Cascade Version | 9.3.b01 |
| Bertini Cascade Version | V09-02-05 |
| Bertini Cascade Version | V09-02-08 |
| Angle | 89 deg |
| Reference | T. Abbott et al, Phys.Rev. D45, 3906 |
| Reference | Yu.D.Bayukov et al, ITEP-148-1983, Sov. J. Nucl. Phys. 42, 116 |
| Score: | passed |
| Type: | expert |

| Results | |
|---------|--|
| MC/Data | $\pi^+ + u \rightarrow p + X$ at 5.00 GeV ($\theta = 89.0^\circ$) |
| | Legend: (9.3.b01), (V09-02-05), (V09-02-08) |
| | Plot of Kinetic Energy of proton (GeV) vs MC/Data ratio. The ratio is approximately 1.0 across the energy range from 0.06 to 0.24 GeV. |



Searching

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Validation Overview

Electromagnetic

Hadronic

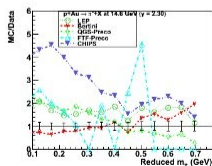
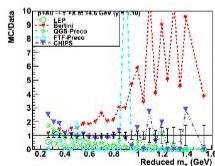
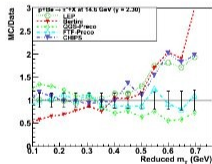
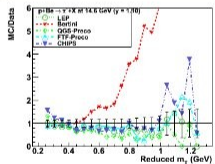
LHC-feedback

Expert

| id | g4version | reaction | observable | Target | CHIPS | Bertini Cascade Version | Geant 4 Version | FTF-Prec0 | Particle | tag | re |
|------|-----------|---|-------------------------------------|--------------|-----------|-------------------------|-----------------|-----------|----------|-----|----|
| 7278 | 9.4.ref01 | p+Be, p+Au -> pi- +X | reduced m_T spectrum | Be, Au | 9.4.ref01 | | | 9.4.ref01 | p | | y |
| 7260 | 9.4.ref01 | p+C -> p+X | kinetic energy of secondary proton | C | 9.4.ref01 | | | | p | | |
| 7262 | 9.4.ref01 | p+C, p+U -> n+X | kinetic energy of secondary neutron | C, U | 9.4.ref01 | | | 9.4.ref01 | p | | |
| 7265 | 9.4.ref01 | p+U -> p+X | kinetic energy of secondary proton | U | 9.4.ref01 | | | 9.4.ref01 | p | | |
| 7268 | 9.4.ref01 | p+Cu->K- +X | reduced m_T spectrum | Cu | 9.4.ref01 | | | 9.4.ref01 | p | | y |
| 7271 | 9.4.ref01 | p+Cu->K+ +X | reduced m_T spectrum | Cu | 9.4.ref01 | | | 9.4.ref01 | p | | y |
| 7275 | 9.4.ref01 | p+Cu->p+X | reduced m_T spectrum | Cu | 9.4.ref01 | | | 9.4.ref01 | p | | y |
| 7279 | 9.4.ref01 | p+Be, p+Au -> pi+ +X | reduced m_T spectrum | Be, Au | 9.4.ref01 | | | 9.4.ref01 | p | | y |
| 7284 | 9.4.ref01 | pi- +C, pi- +Cu, pi- +Pb, pi- +U -> n+X | kinetic energy of secondary neutron | C, Cu, Pb, U | 9.4.ref01 | | | 9.4.ref01 | pi- | | |

Test
g4version *
Binary *

New Search



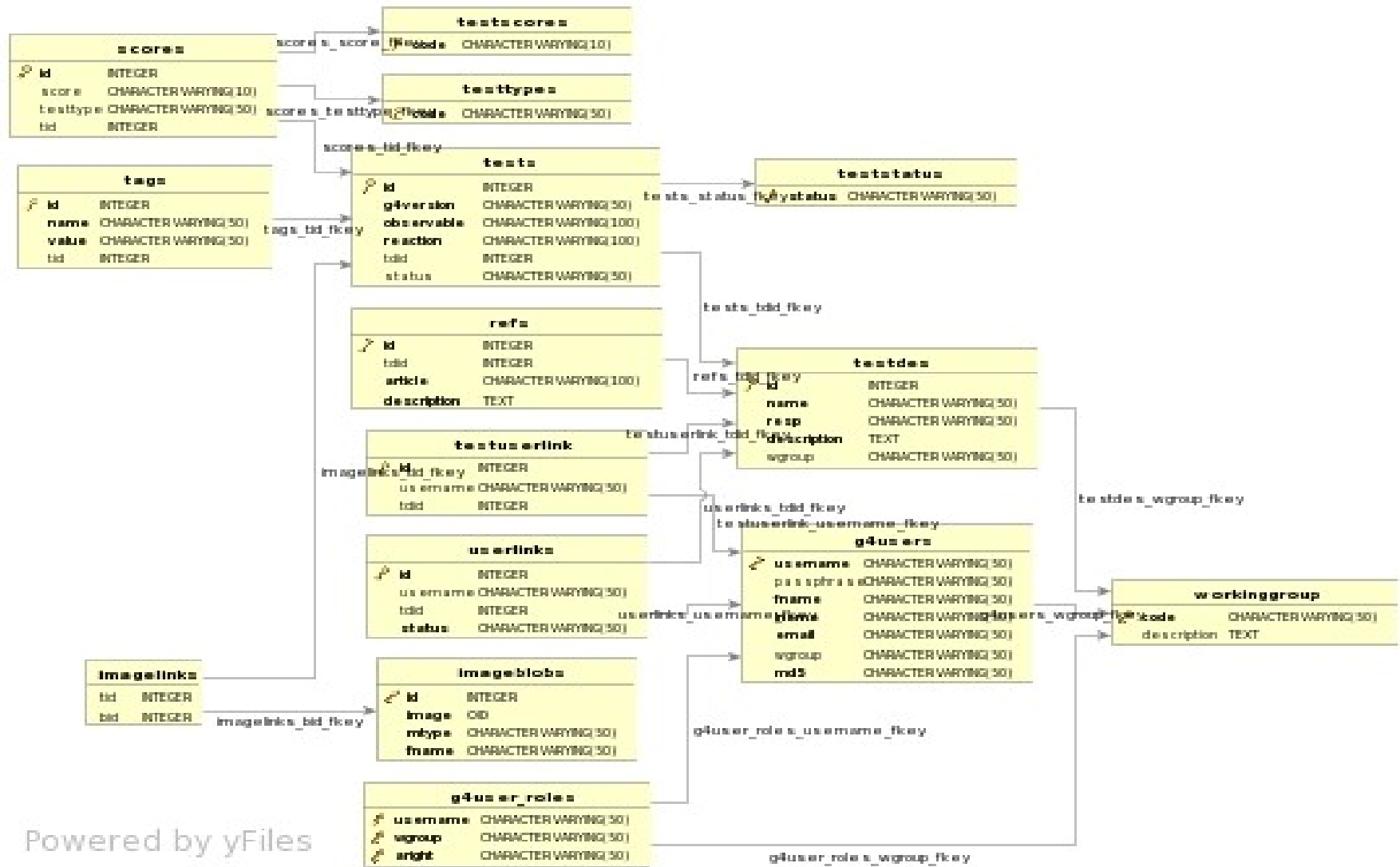
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Data Base schema



Xml description to upload tests into the database

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<!--
```

```
Document : insert_g4test.xml
```

```
Created on : September 20, 2011, 11:36 AM
```

```
Author : wenzel
```

```
Description: xml description to upload geant 4 test into database
```

```
-->
```

```
<testslis>
```

```
<tests>
```

```
<testdes>test47</testdes>
```

```
<g4version>9.2.ref08</g4version>
```

```
<observable>Inclusive m_T spectrum</observable>
```

```
<reaction>p+Cu->K- +X</reaction>
```

```
<score>%scoreid</score>
```

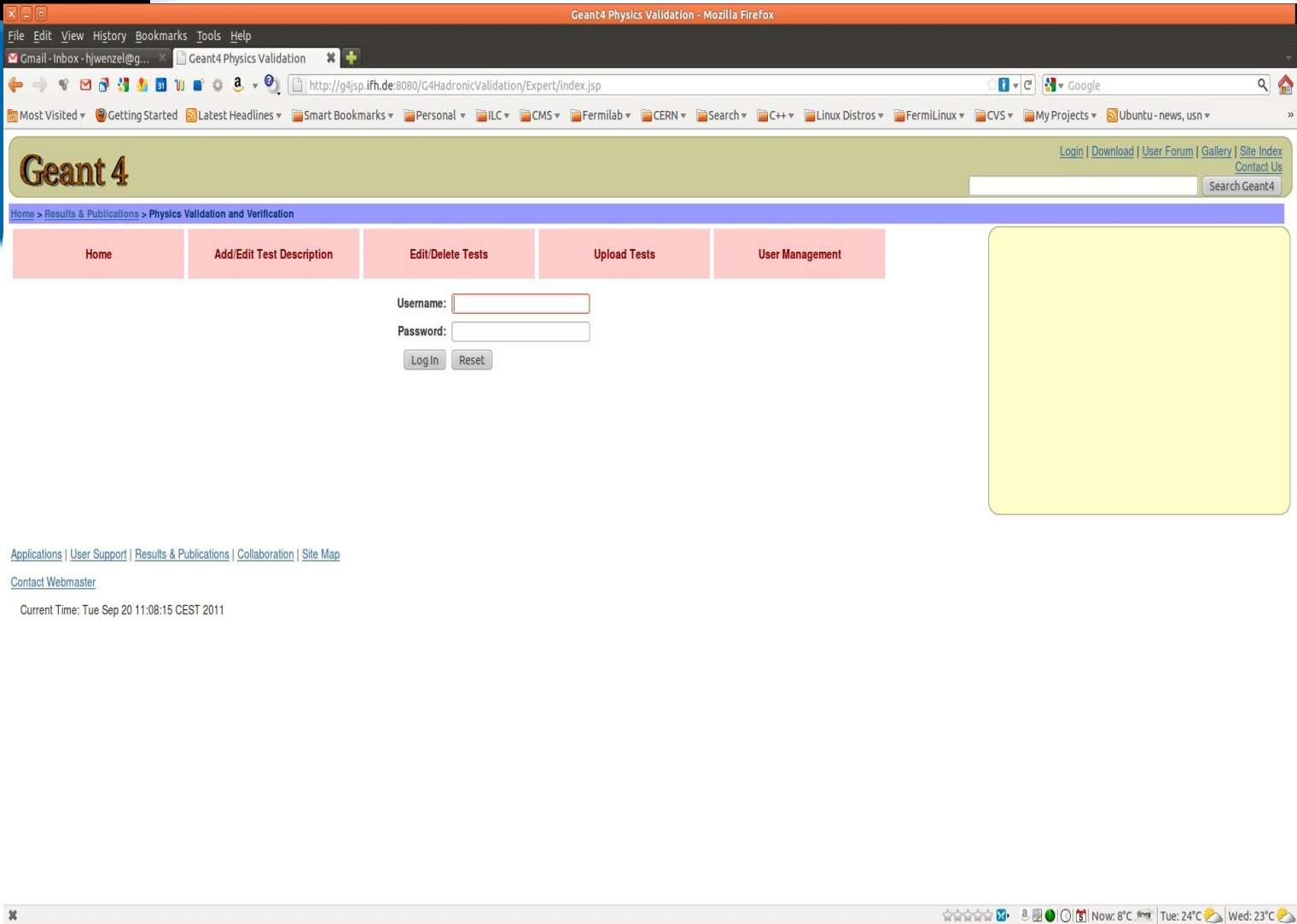
```
<imageblob>/home/wenzel/transm_PbF1_F10-1.jpg</imageblob>
```


Xml description to upload tests into the database (cont.)



```
<taglist>
  <tag>
    <name>Target</name>
    <value>Copper</value>
  </tag>
  <tag>
    <name>Particle</name>
    <value>p</value>
  </tag>
  <tag>
    <name>Energy</name>
    <value>14.6 GeV/c</value>
  </tag>
  <tag>
    <name>Bertini Cascade Version</name>
    <value>9.3.b01</value>
  </tag>
  <tag>
    <name>Rapidity</name>
    <value>y=2.1</value>
  </tag>
</taglist>
<referencelist>
  <reference>%refid1</reference>
  <reference>%refid1</reference>
</referencelist>
</tests>
</testslist>
```

Expert page



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Status

In the past weeks we concentrated on cleaning up refactoring and packaging

→ this will make further development easier:

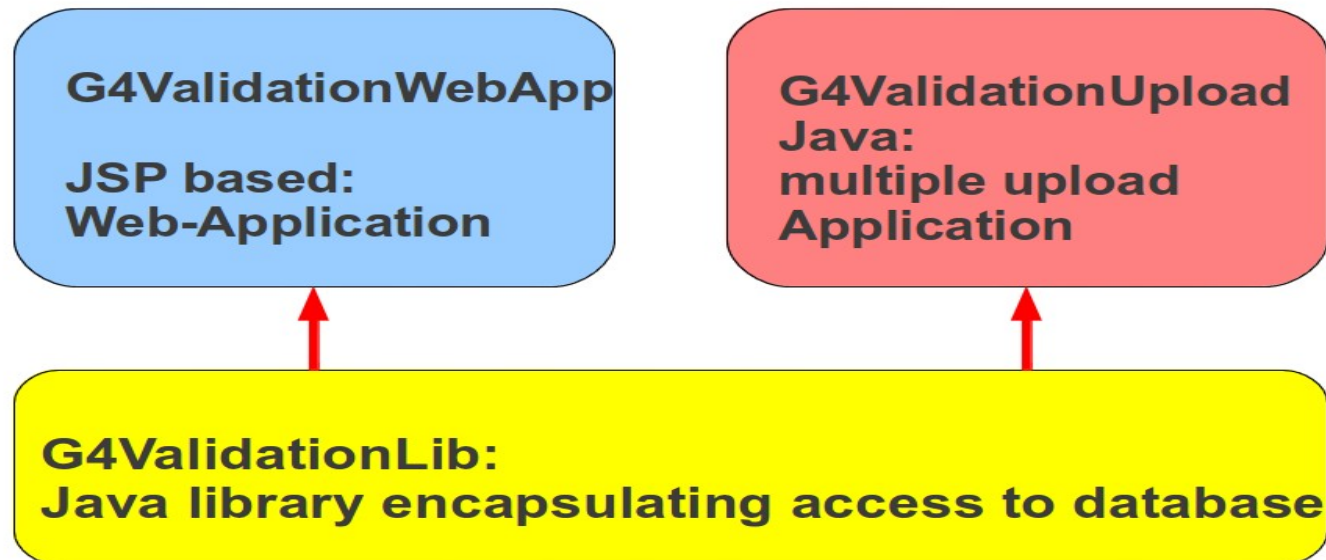
- Postgres Database and Web application are now available at Fermilab and DESY Zeuthen using different server (db and webapp) configurations:
- DESY:
<http://g4jsp.ifh.de:8080/G4HadronicValidation/>
- FNAL:
<http://g4validation.fnal.gov:8080/G4HadronicValidation/>
- Prototype application that shows some features that we are developing for g4validation (Summer student Jennifer Karkoska) :

(zooming, better search features etc.)

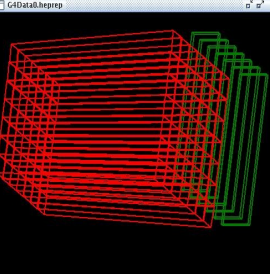
<http://g4validation.fnal.gov:8080/DRImageWebApp/>

Status (cont.)

- Java Library to connect to db, JSP Web-Application, Multiple File upload java application are now clearly separated and packaged.



Plans

- 
- Provide multiple file upload application using xml description
 - Improve performance/appearance of Web Application
 - Implement new feature zooming, better search features etc. see:
<http://g4validation.fnal.gov:8080/DRImageWebApp/>
 - Import experimental data into database and create plots on the fly allow for overlays comparisons etc.
 - Database schema defined.
 - Jfreechart seems to be a good plotting tool.
 - Evaluate frameworks (JSF) and different Server Configurations (e.g. control db access, security..)