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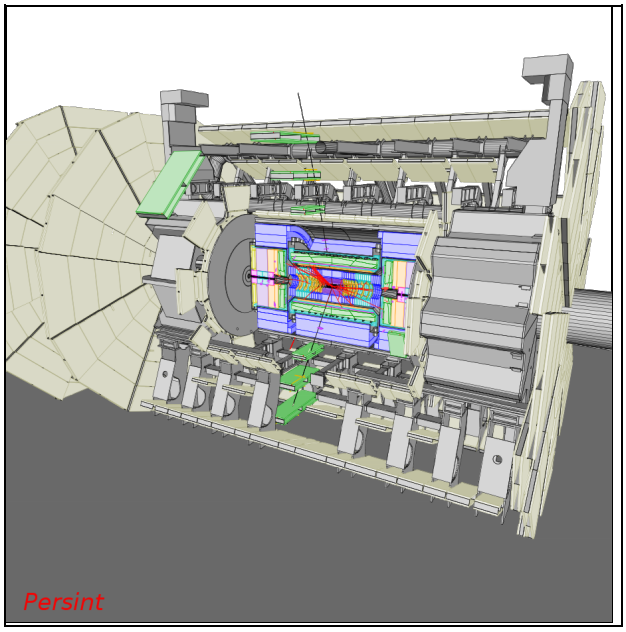
Persint

An ATLAS Detector and Event Display



Introduction

This page provides documentation and instructions for installing ***Persint***, one of the detector and event displays for the ATLAS experiment: PersintWiki

Documentation and support

- *Persint* **User Manual** : PDF.
- **Mailing list**: atlas-sw-persint-support (users without a CERN account need to create an external account and subscribe first).
- AMDB User Manual : PDF.
- AGDD Volume Description Format: AGDDVolumeTypes
- Description of the MboyView Event File ASCII format read by *Persint*.
- How to dump the contents of an ESD into an ASCII event file readable by *Persint* : PersintDumpESD.
- Main *Persint* page: PersintWiki

Other links

- ChangeLog
- TODO
- Browse the *Persint* source code SVN repository .
- Browse the *Persint* source code CVS repository (before migration to subversion).
- Browse the *Persint* source code CVS repository (before migration from HIGZ to Qt user interface).
- Browse the *Persint* Doxygen documentation for developers.
- Additional documents about *Persint*
    - ♦ LBNL Seminar, 22 June 2010
    - ♦ Muon Software Tutorial (Muon Week), 27 October 2008
    - ♦ Third meeting on Event Displays for ATLAS, 10 March 2008

♦ Second meeting on Event Displays for ATLAS, 27 November 2007

Supported platforms

- *Persint* is developed under the latest **Ubuntu** release. We also make sure it runs at CERN on **lxplus** machines as well as under **Fedora**. We provide best effort support for **Mac OS X**.
  History of Persint installation tests

Platform					Persint	
OS	**Release**	**Arch.**	**GCC**	**Qt**	**Release**	**Notes**
Ubuntu	Precise LTS (12.04)	amd64/i386	4.6.2	4.7.4	00-02-37	
	Oneiric (11.10)	amd64/i386	4.6.1	4.7.4	00-02-37	
	Natty (11.04)	amd64/i386	4.5.2	4.7.2	00-02-37	
	Maverick (10.10)	amd64/i386	4.4.5	4.7.0	00-02-37	
	Lucid LTS (10.04)	amd64/i386	4.4.3	4.6.2	00-02-31	
	Hardy LTS (8.04)	amd64/i386	4.2.3	4.3.4	00-02-27	
Scientific Linux Cern	Carbon (6.x)	-	-	-	-	lxplus
	Boron (5.7)	x86_64	4.3	4.4.2	00-02-37	lxplus
Mac OS X	Snow Leopard (10.6.8)	64 bit	4.2.1	4.7.4	00-02-37	
Fedora	Verne (16)	i686	4.6.2	4.8.0	00-02-36	VirtualBox 4.1 on Ubuntu
	Lovelock (15)	i686	4.6.1	4.7.4	00-02-36	VirtualBox 4.1 on Ubuntu
	Laughlin (14)	i686	4.5.1	4.7.4	00-02-36	VirtualBox 4.1 on Ubuntu
Debian	Squeeze (6.0)	x86_64	4.4.5	4.6.3	00-02-36	VirtualBox 4.1 on Ubuntu
CentOS	6.0	x86_64	4.4.4	4.6.2	00-02-36	VirtualBox 4.0 on Ubuntu
	5.7	i386	4.1.2	4.7.4	00-02-27	VirtualBox 4.0 on Ubuntu
Cygwin	1.7	i686	4.5.3	4.5.3	00-02-36	Tested under Windows 7
CernVM	2.3.0	x86_64	4.1.2	4.6.3	00-02-13	VirtualBox 4.0 on Ubuntu
CernVM	2.4.0	x86	?	4.6.3	00-02-13	VirtualBox 4.0 on Mac OS X

Installation

- Latest release : **Persint-00-02-37**
- Older releases
- **Forum**: bugs, comments, installation problems, or questions can be reported to the **mailing list**.

Tarball - Download and install complete source tarball (15 MB)

```
wget http://atlas.web.cern.ch/Atlas/GROUPS/MUON/Persint/releases/00.02.37/src/Persint-00-02-37.ta
tar xvfz Persint-00-02-37.tar.gz
cd Persint-00-02-36
./configure
make -j3
./start_persint.sh
```

Warning : the above instructions assume all dependencies are satisfied.

svn - Download code from source repository and install

After configuring subversion, checkout the *Persint* source code. From the Persint directory, run the *bootstrap.sh* script to download other required Atlas software components. You can than start compilation with "make". After you are done, simply run the *start_persint.sh* script, that will set your library and binary paths and run the program.

```
export SVNROOT=svn+ssh://svn.cern.ch/reps/atlasoff
svn checkout $SVNROOT/graphics/Persint/tags/Persint-00-02-37 Persint-00-02-37
cd Persint-00-02-37
./bootstrap.sh
make -j3
./start_persint.sh
```

Warning : the above instructions assume all dependencies are satisfied.

Subversion configuration : if your local username is different from your lxplus username, you may need to specify the latter in your *$HOME/.ssh/config* file. For more details, see SoftwareDevelopmentWorkBookSVN#Access_to_the_SVN_repositories.

Ubuntu package

Persint is available as an Ubuntu package on a dedicated repository. However, this package provides a version of *Persint* without histograms (because ROOT is no longer available as an Ubuntu package). To benefit from histograms, you need to install *Persint* by hand.

Pre-installed lxplus version

If you have an account on the lxplus network, you can run a version of *Persint* pre-installed on AFS, though it might be a little slower :

```
ssh -X lxplus.cern.ch
\ln -sf /afs/cern.ch/atlas/www/GROUPS/MUON/Persint/releases/00.02.37/slc5-x86_64-gcc43/share/Pers
./start_persint.sh
```

Dependencies

N.B. : *Persint* no longer requires either CERNLIB, HIGZ or LAPACK.

Mandatory requirements

Install a C++ compiler

- **Ubuntu**
  ```
  sudo apt-get install g++
  ```
- **Mac OS X**
  After installing MacPorts :
  ```
  sudo port install gcc46
  ```
- **Fedora**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install gcc-c++
  ```
- **Debian**
  ```
  sudo apt-get install g++
  ```
- **CentOS 5/6**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install gcc-c++
  ```
- **CernVM**
  After installing OpenAFS:
  ```
  source /afs/cern.ch/sw/lcg/external/gcc/4.3/`uname -m`-slc5/setup.sh
  ```
- **Cygwin**
  Update your Cygwin installation by running the setup.exe program to install the following package:
  ```
  gcc4-g++
  ```

Install a fortran compiler

- **Ubuntu**
  ```
  sudo apt-get install gfortran
  ```
- **Mac OS X**
  After installing MacPorts:
  ```
  sudo port install gcc46
  sudo ln -s /opt/local/bin/gfortran-mp-4.6 /opt/local/bin/gfortran
  ```
- **Fedora**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install gcc-gfortran
  ```
- **Debian**
  ```
  sudo apt-get install gfortran
  ```
- **CentOS 5/6**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install gcc-gfortran
  ```
- **Cygwin**
  Update your Cygwin installation by running the setup.exe program to install the following package:
  ```
  gcc4-fortran
  ```

Install other standard utilities : *wget*, *make*, *perl*, *pkg-config*, *head*, *sed*

- **Mac OS X**
  After installing MacPorts:
  ```
  sudo port install wget pkgconfig
  export PKG_CONFIG_PATH=/opt/local/lib/pkgconfig;
  ```
  You might want to add PKG_CONFIG_PATH to your login script.
- **Fedora**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install wget pkgconfig xterm perl
  ```
- **Debian**
  ```
  sudo apt-get install make pkg-config
  ```

- **CentOS 5/6**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install wget pkgconfig xterm perl make
  ```
- **Cygwin**
  Update your Cygwin installation by running the setup.exe program to install the following packages:
  ```
  wget make sed tar pkg-config
  ```

Install Qt

Persint requires Nokia's **Qt** framework (≥ 4.3.4).

- **Ubuntu**
  ```
  sudo apt-get install libqt4-dev
  ```
- **Mac OS X**
  After installing MacPorts:
  ```
  sudo port install qt4-mac +debug
  ```
  This may take a while...
- **Fedora**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install qt-devel
  ```
- **Debian**
  ```
  sudo apt-get install libqt4-dev
  ```
- **CentOS 5**
  The release of *Qt* (4.2) provided by the *qt4-devel* CentOS 5 package is too old for *Persint*. Hence, *Qt* needs to be installed from source. Set the PKG_CONFIG_PATH variable appropriately to indicate to *Persint* the location of Qt.
- **CentOS 6**
  With administrative privileges (*su* command), execute the following command line:
  ```
  yum install qt-devel
  ```
- **Cygwin**
  Update your Cygwin installation by running the setup.exe program to install the following packages:
  ```
  qt4-devel-tools libQtCore4-devel libQtGui4-devel libQtTest4-devel libQtNetwork4-devel
  ```

- **CernVM**
  After installing OpenAFS, add the path of Qt on AFS to the PKG_CONFIG_PATH variable:
  ```
  export PKG_CONFIG_PATH=/afs/cern.ch/sw/lcg/external/qt/4.6.3/`uname -m`-slc5-gcc43-opt/lib
  ```
- **Scientific Linux Cern**
  The release of *Qt* (4.2) provided by the **qt4-devel** SLC5 package is too old for *Persint*. Hence, *Qt* needs to be installed from source.
  - ♦ lxplus
    The location of the **Qt** library on AFS will be automatically taken care of by the Persint makefile and the start up script.
  - ♦ Non-lxplus machine with access to CERN AFS directories
    Qt is installed in the */afs/cern.ch/sw/lcg/external/qt/* directory. Choose the appropriate version and add the path of the *lib/pkgconfig* subdirectory to your PKG_CONFIG_PATH environment variable.
  - ♦ Standalone machine
    Download and install Qt from source. If you do not install it into a standard location, add the path of the *lib/pkgconfig* subdirectory to your PKG_CONFIG_PATH environment variable.

Optional features

Install QtROOT

QtRoot is a Qt plugin of ROOT, used to display ROOT histograms within the Qt interface. The version of QtROOT you install should be *compatible with your version of the Qt4 library*.

- **General instructions**
  - ♦ Method 1
    The simplest way to get QtROOT is to install ROOT with the *--enable-qt* flag. You first need to install *Qt* and *pkg-config* to allow the *ROOT* configure script to find *Qt*. Then :

```
wget ftp://root.cern.ch/root/root_v5.30.00.source.tar.gz
tar xvfz root_v5.30.00.source.tar.gz
cd root
export QTDIR=`pkg-config --variable=prefix QtCore`
./configure --enable-qt --prefix=<PREFIX> --etcdir=<PREFIX>/etc
make
make install
```

  - ♦ Method 2
    To install the latest QtRoot module, you will need to use the official INSTALL_QTROOT.sh script and to follow these instructions. This method is for experts of Unix only. After installing *Qt* and *pkg-config*, you will have to download the INSTALL_QTROOT.sh script and patch the script before running it:

```
wget http://root.bnl.gov/QtRoot/INSTALL_QTROOT.sh
wget http://atlas.web.cern.ch/Atlas/GROUPS/MUON/Persint/releases/INSTALL_QTROOT.sh.p
patch < INSTALL_QTROOT.sh.patch
chmod u+x INSTALL_QTROOT.sh
export QTDIR=`pkg-config --variable=prefix QtCore`
. ./INSTALL_QTROOT.sh
The existing version of Qt package has been found under QTDIR=
Do you want to use it? (yes/no) yes
Do you want to proceed? (yes/no) yes
Do you want to install COIN3D also? (yes/no) no
```

    After installation is complete, you need to run the QtRoot setup script:

```
./set_environment.sh
```

    You might want to add this command to your login script.
- **Ubuntu**
  In Ubuntu releases 8.10 (Intrepid), 9.04 (Jaunty), 10.04 (Lucid) and 10.10 (Maverick), QtRoot is directly available as an Ubuntu package :

```
sudo apt-get install root-plugin-qt libroot-dev
```

  For other releases, follow general instructions above, but set the QTDIR variable by hand to:

```
export QTDIR=/usr/share/qt4
```

- **Mac OS X**
  After installing MacPorts, install the *qt_mac* variant of the *root* port:

```
sudo port install root +qt_mac
```

- **Fedora**
  With administrative privileges (*su* command), execute the following command line:

```
yum install root-gui-qt root-physics
```

- **CernVM**
  After installing OpenAFS:

```
source /afs/cern.ch/sw/lcg/app/releases/ROOT/5.30.00/`uname -m`-slc5-gcc43-opt/root/bin/th
```

Install the SOCI library

Persint uses the SOCI library for access to the ATLAS Oracle databases, to download extra geometry files. This feature is **really optional**.

1. Install the Oracle Database **Instant Client** software development kit
   - ♦ **Ubuntu**

1. Go to the Oracle download page, in the *Instant client* section and select the appropriate platform. Download the Instant Client Basic RPM package and the Instant Client SDK RPM package. You will need to create a (free) Oracle user account an to accept the license agreement.
2. Convert the RPM packages into debian packages :
```
sudo apt-get -y install alien
sudo alien -d oracle-instantclient-basic-<version>-<platform>.rpm oracle-inst
```
3. Install the generated debian packages and their dependency *libaio* :
```
sudo dpkg -i oracle-instantclient-basic-<version>-<platform>.deb oracle-insta
sudo apt-get -y install libaio1
```
4. Define some environment variables to notify Persint of Oracle's location :
```
export ORACLE_LIBDIR=/usr/lib/oracle/<version>/client/lib;
export ORACLE_INCDIR=/usr/include/oracle/<version>/client;
```
(The exact name of the installation directories will depend on your platform.)

- **Mac OS X**
  - Install the *oracle-instantclient* port:
```
sudo port install oracle-instantclient
```
MacPorts may not be able to download the necessary files. In that case, you shall :
    1. Delete intermediate files created by the failed building process and create a directory */opt/local/var/macports/distfiles/oracle-instantclient*:
```
sudo port clean --all oracle-instantclient
sudo port selfupdate
sudo mkdir -p /opt/local/var/macports/distfiles/oracle-instantclient
```
    2. Go to the Oracle download page, register, download the *instantclient-basic-10.2.0.4.0-macosx-x64.zip* and *instantclient-sdk-10.2.0.4.0-macosx-x64.zip* packages manually and place them into the newly created the */opt/local/var/macports/distfiles/oracle-instantclient* directory:
```
sudo mv instantclient-*.zip /opt/local/var/macports/distfiles/oracle-i
```
Make sure you download the actual zip files and not an HTML error page (accept the license agreement first, and use the left mouse button).
    3. Install the downloaded packages
```
sudo port install oracle-instantclient
```
This time it should work.
  - Define some environment variables to notify *Persint* of Oracle's location:
```
export ORACLE_LIBDIR=/opt/local/lib/oracle
export ORACLE_INCDIR=/opt/local/lib/oracle/sdk/include
```
- **Scientific Linux Cern**

On a SLC machine with access to CERN AFS directories:
```
export ORACLE_INCDIR=/afs/cern.ch/atlas/www/GROUPS/MUON/Persint/releases/opt/oracle/
export ORACLE_LIBDIR=/afs/cern.ch/atlas/www/GROUPS/MUON/Persint/releases/opt/oracle/
```

2. Install the **SOCI** C++ Database Access library.
- **General instructions**
```
wget http://downloads.sourceforge.net/soci/soci-3.0.0.tar.gz
tar xvfz soci-3.0.0.tar.gz
\rm soci-3.0.0.tar.gz
cd soci-3.0.0
wget http://atlas.web.cern.ch/Atlas/GROUPS/MUON/Persint/releases/soci-3.0.0.patch
patch -p1 < soci-3.0.0.patch
./configure --include-prefix=<PREFIX>/include --lib-prefix=<PREFIX>/lib --oracle-inc
make
make install
```
Where <*PREFIX*> is the installation path of your choice. You might encounter an error if the version of your Oracle client is recent as SOCI expects version 10. Just patch the SOCI source code before compilation :
```
sed -i 's;nnz10;nnz<version>;g' build/unix/build-oracle.tcl
sed -i 's;nnz10;nnz<version>;g' src/backends/oracle/test/Makefile.basic
```
Inform *Persint* of the library's location with an environment variable :

```
export SOCI_HOME=<PREFIX>;
```

- **Scientific Linux Cern**
  On a SLC machine with access to CERN AFS directories:
  ```
  export SOCI_HOME=/afs/cern.ch/atlas/www/GROUPS/MUON/Persint/releases/opt;
  ```

Platform-specific instructions

Mac OS X

Installing MacPorts

To install the required dependencies, you might want to install MacPorts.

1. First install, if not already done, Apple's **Xcode** tools from Mac OS X installation DVD or from Apple's site;
2. Download and install the **MacPorts** software distribution package.
3. Update the list of available ports:
   ```
   sudo port selfupdate
   ```

Updating MacPorts ports

```
sudo port selfupdate
sudo port upgrade outdated
```

CernVM

Installing CernVM

- VirtualBox
- http://cernvm.cern.ch/portal/downloads
- CernVM
- CernVMGuideSoftwareInstall

Installing OpenAFS

- See CernVM release notes
- Do:
  ```
  sudo conary update group-openafs-client openafs openafs-client
  sudo conary update kernel-module-openafs-`uname -r`
  sudo mkdir -p /afs
  echo cern.ch > /tmp/ThisCell
  sudo cp /tmp/ThisCell /usr/vice/etc/ThisCell
  ```
  After reboot, AFS should be mounted under /afs. To authenticate use the *kinit* command.

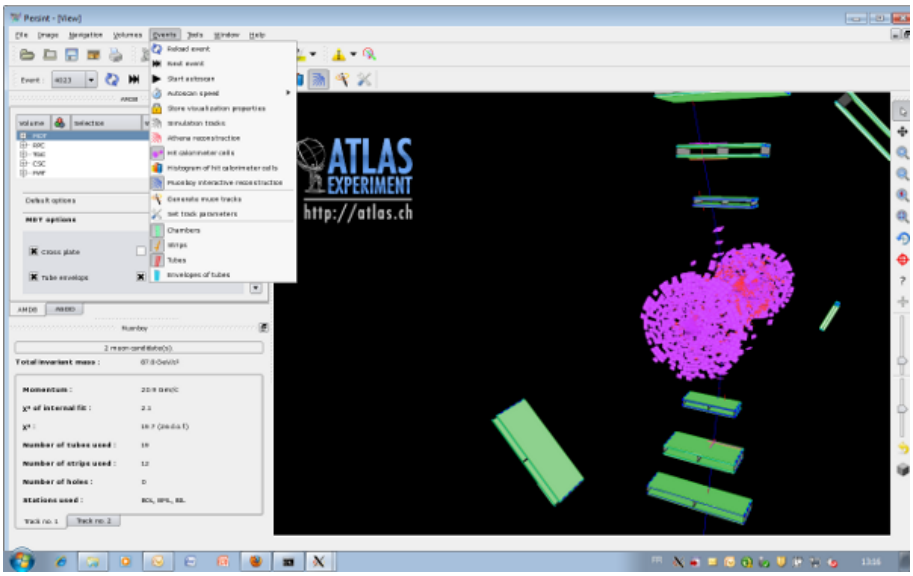
Installing binary distribution of *Persint*

- Install AFS and authenticate with *kinit*
- Download, install and setup binary kit
  ```
  wget http://atlas.web.cern.ch/Atlas/GROUPS/MUON/Persint/releases/00.02.13/Persint-00-02-13
  tar xvfz Persint-00-02-13-cernvm-`uname -m`-gcc43-qt463.tar.gz
  cd Persint-00-02-13
  source install_cernvm.sh
  ./start_persint.sh
  ```

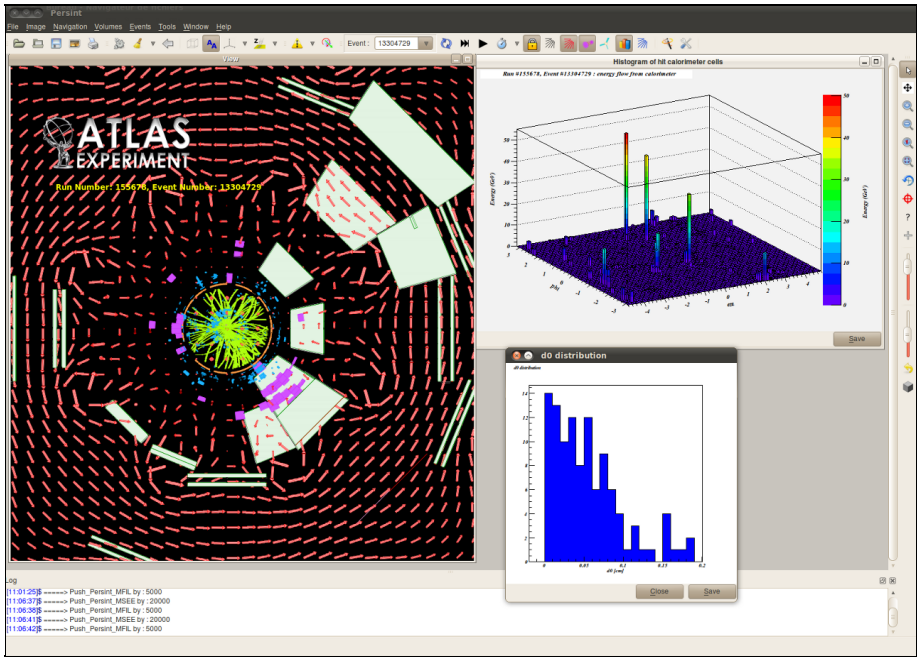
Cygwin

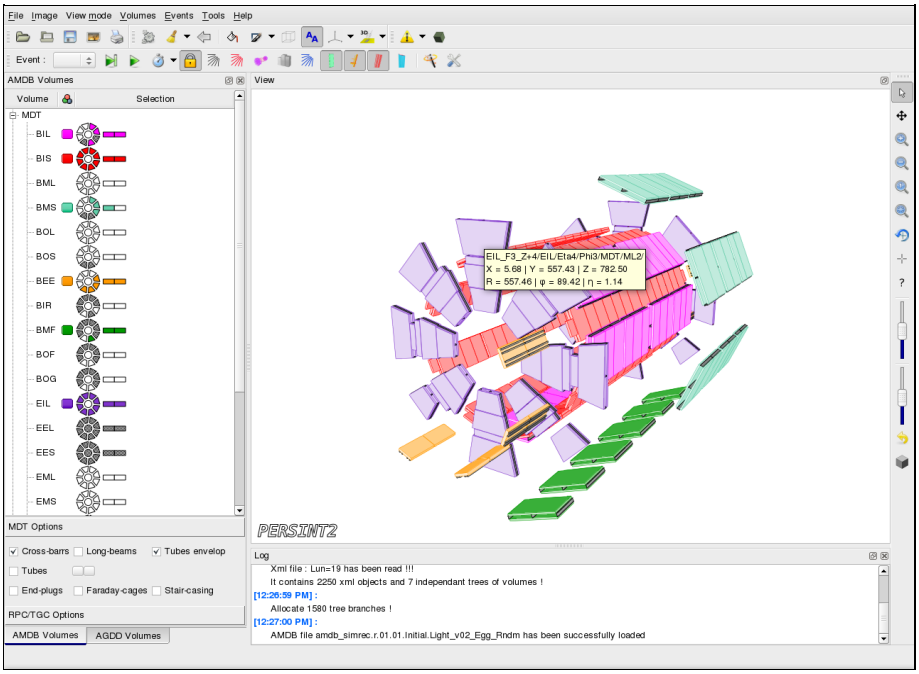
Installing Cygwin under Windows 7

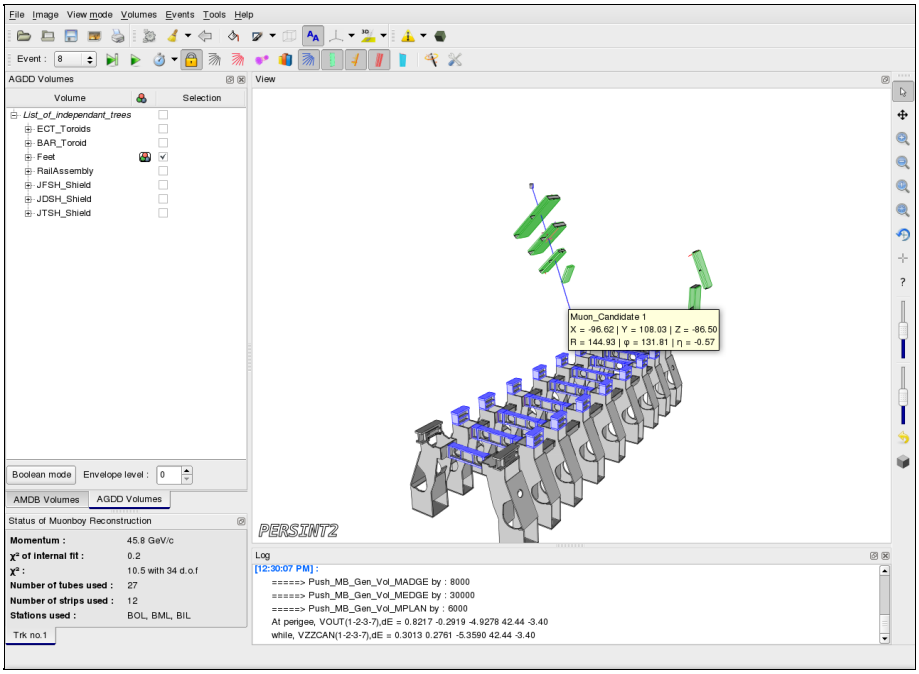
- Install Cygwin by running setup.exe.
  - ♦ In addition to the packages listed in the dependencies, select the following packages required to connect to an X server.
    `xorg-server xinit`
  - ♦ Before starting *Persint* (using the *start_persint.sh* script), connect to a Cygwin/X server by typing *startxwin* from the Cygwin shell.

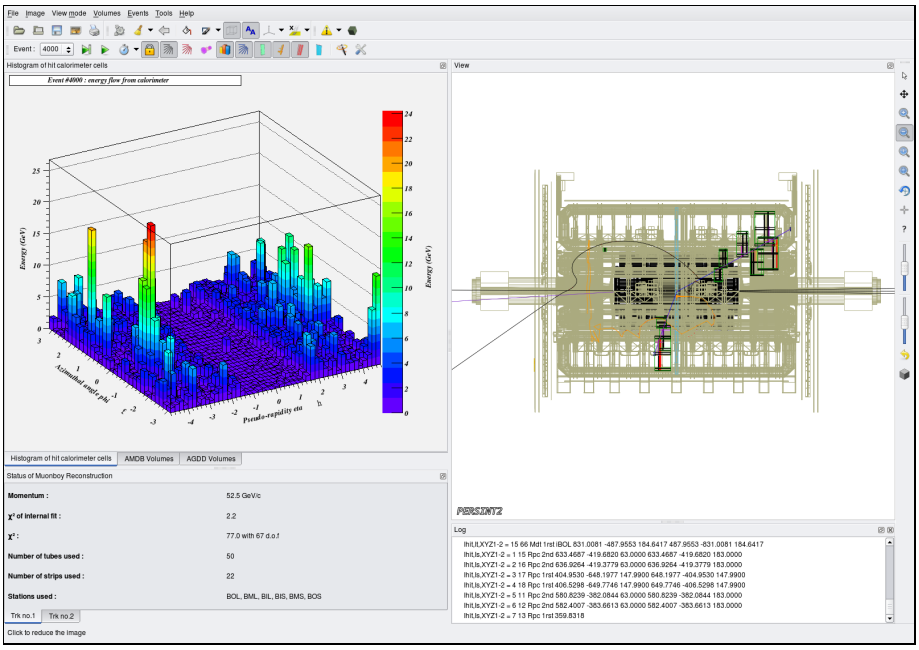


Screenshots




File Image View mode Volumes Events Tools Help
Event :
AMDB Volumes
Volume
Selection
MDT
BIL
BIS
BML
BMS
BOL
BOS
BEE
BIR
BMF
BOF
BOG
EIL
EEL
EES
EML
EMS
MDT Options
Cross-barrs
Long-beams
Tubes envelop
Tubes
End-plugs
Faraday-cages
Stair-casing
RPC/TGC Options
AMDB Volumes
AGDD Volumes
View
EIL_F3_Z+4/EIL/Eta4/Phi3/MDT/ML2/
X = 5.68 | Y = 557.43 | Z = 782.50
R = 557.46 | φ = 89.42 | η = 1.14
PERSINT2
Log
Xml file : Lun=19 has been read !!!
It contains 2250 xml objects and 7 independant trees of volumes !
[12:26:59 PM] :
Allocate 1580 tree branches !
[12:27:00 PM] :
AMDB file amdb_simrec.r.01.01.Initial.Light_v02_Egg_Rndm has been successfully loaded


File Image View mode Volumes Events Tools Help
Event : 8
AGDD Volumes
Volume
Selection
List_of_independant_trees
ECT_Toroids
BAR_Toroid
Feet
RailAssembly
JFSH_Shield
JDSH_Shield
JTSH_Shield
Boolean mode
Envelope level : 0
AMDB Volumes
AGDD Volumes
Status of Muonboy Reconstruction
Momentum : 45.8 GeV/c
χ² of internal fit : 0.2
χ² : 10.5 with 34 d.o.f
Number of tubes used : 27
Number of strips used : 12
Stations used : BOL, BML, BIL
Trk no.1
View
Muon_Candidate 1
X = -96.62 | Y = 108.03 | Z = -86.50
R = 144.93 | φ = 131.81 | η = -0.57
PERSINT2
Log
[12:30:07 PM] :
=====> Push_MB_Gen_Vol_MADGE by : 8000
=====> Push_MB_Gen_Vol_MEDGE by : 30000
=====> Push_MB_Gen_Vol_MPLAN by : 6000
At perigee, VOUT(1-2-3-7),dE = 0.8217 -0.2919 -4.9278 42.44 -3.40
while, VZZCAN(1-2-3-7),dE = 0.3013 0.2761 -5.3590 42.44 -3.40



Videos

Contacts

Please report bugs, comments, installation problems, or questions to the **mailing list**.

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This topic: Atlas > Persint2Wiki
Topic revision: r319 - 19-Dec-2011 - 17:45:26 - PatrickSizun