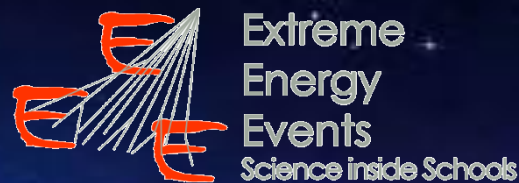


ROOT

INSTALLATION GUIDE

(for Windows)



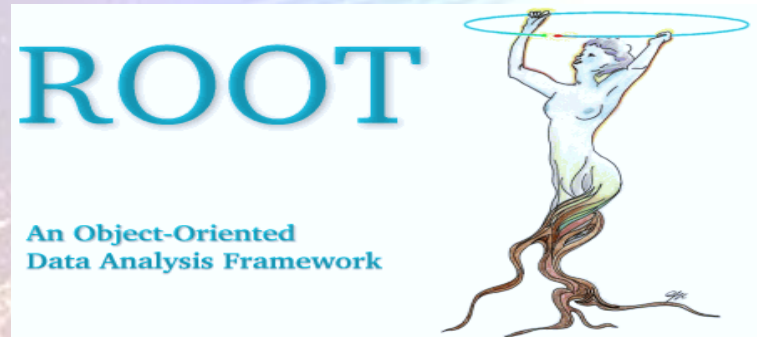
ROOT

An Object-Oriented Data Analysis Framework

HOMEPAGE: root.cern.ch

DOWNLOAD (all releases): <https://root.cern.ch/releases>

GUIDE: <https://d35c7d8c.web.cern.ch/sites/d35c7d8c.web.cern.ch/files/ROOT5Primer.pdf>



DOWNLOAD ROOT (v5.34.38)

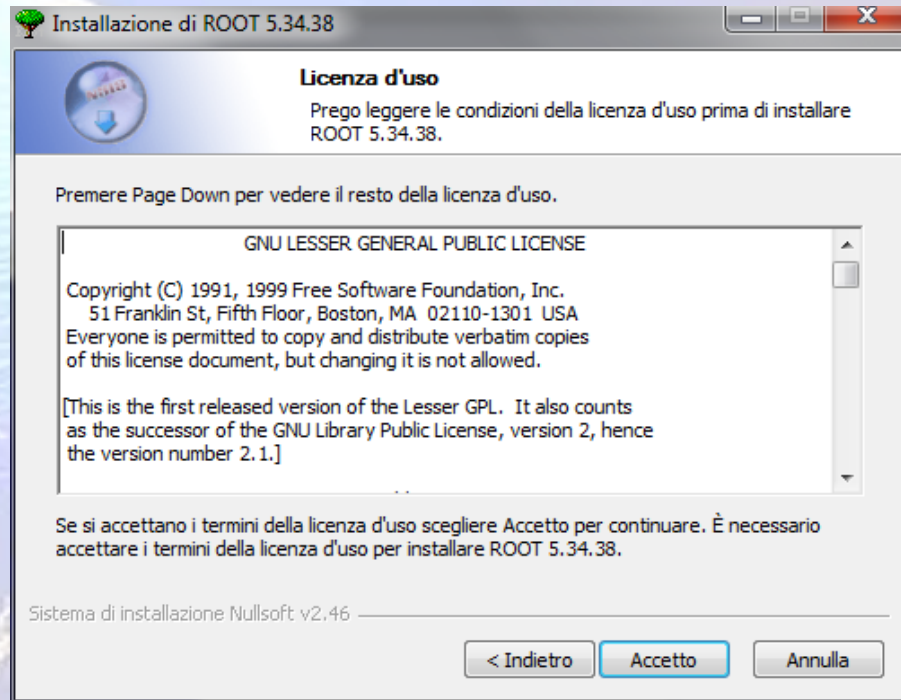
<https://root.cern.ch/content/release-53438>

Binary distributions

| Platform | Files | Size |
|----------------------------------|---|------|
| Ubuntu 14 gcc4.8 | root_v5.34.38.Linux-ubuntu14-x86_64-gcc4.8.tar.gz | 62M |
| OsX 10.11 clang80 | root_v5.34.38.macosx64-10.11-clang80.dmg | 59M |
| OsX 10.11 clang80 | root_v5.34.38.macosx64-10.11-clang80.tar.gz | 58M |
| Windows Visual Studio 2012 (dbg) | root_v5.34.38.win32.vc11.debug.exe | 98M |
| Windows Visual Studio 2012 (dbg) | root_v5.34.38.win32.vc11.debug.zip | 151M |
| Windows Visual Studio 2012 | root_v5.34.38.win32.vc11.exe | 47M |
| Windows Visual Studio 2012 | root_v5.34.38.win32.vc11.zip | 65M |
| Windows Visual Studio 2013 (dbg) | root_v5.34.38.win32.vc12.debug.exe | 99M |
| Windows Visual Studio 2013 (dbg) | root_v5.34.38.win32.vc12.debug.zip | 151M |
| Windows Visual Studio 2013 | root_v5.34.38.win32.vc12.exe | 47M |
| Windows Visual Studio 2013 | root_v5.34.38.win32.vc12.zip | 64M |

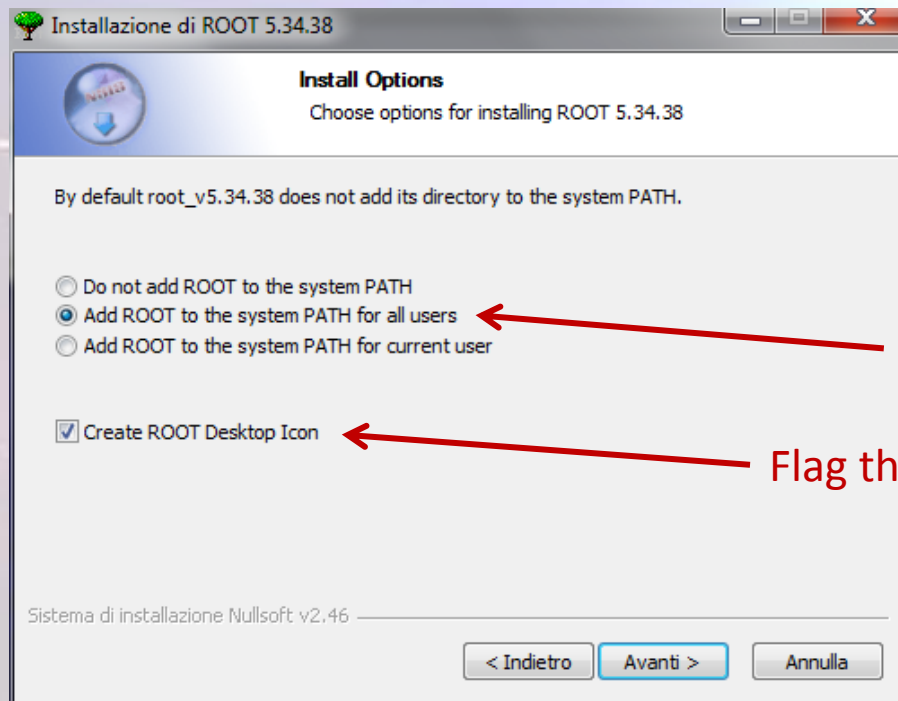
DOWNLOAD ROOT (v5.34.38)

Follow the wizard's instructions



DOWNLOAD ROOT (v5.34.38)

Follow the wizard's instructions

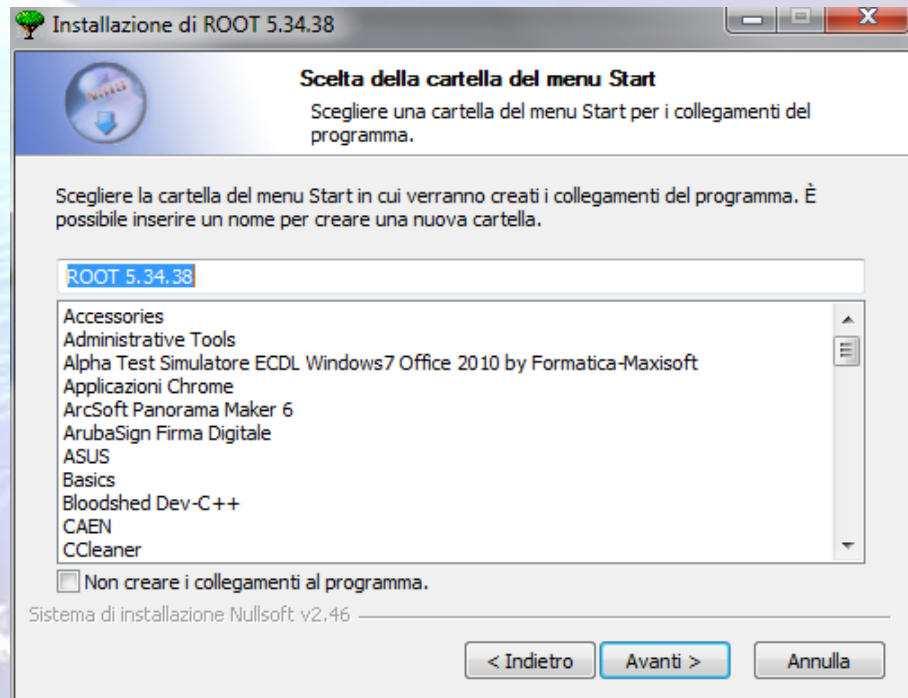
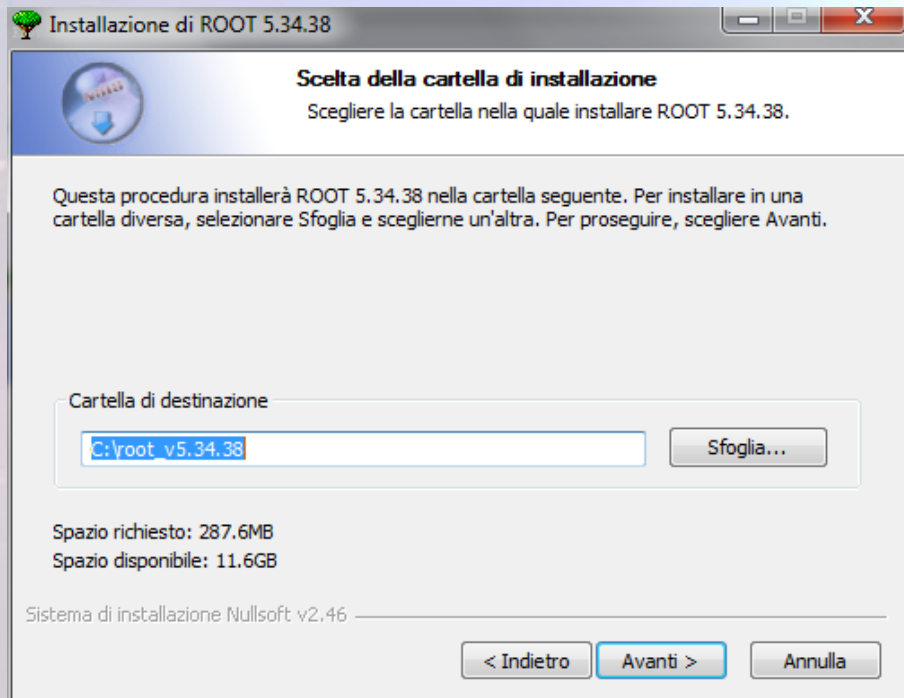


Select this option

Flag this option

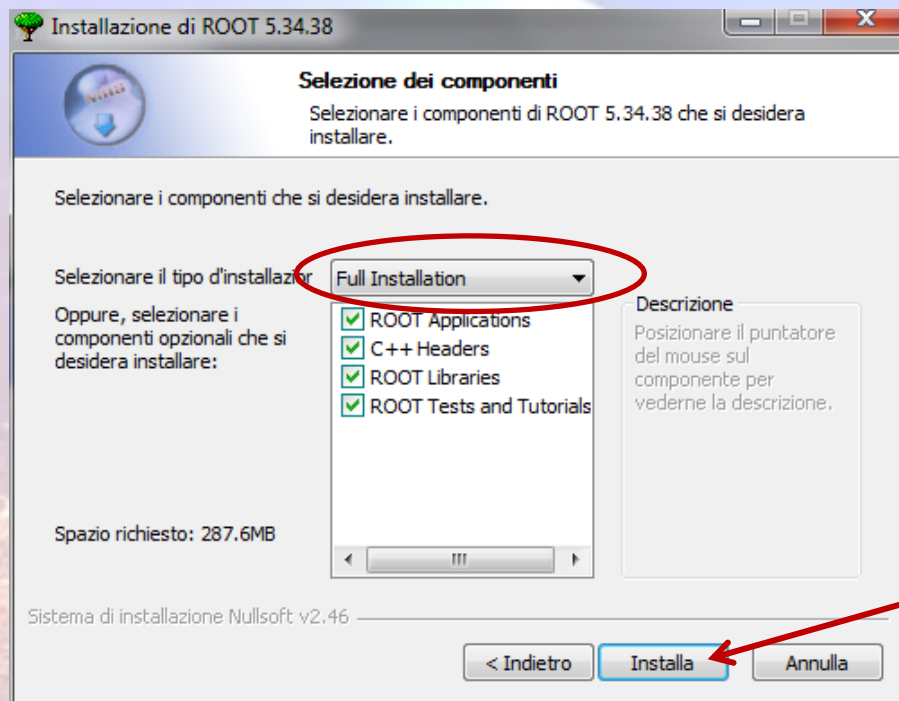
DOWNLOAD ROOT (v5.34.38)

Follow the wizard's instructions



DOWNLOAD ROOT (v5.34.38)

Follow the wizard's instructions



Press install...
and wait

STARTING ROOT

- Open a ROOT terminal (double click on the ROOT icon)



- ROOT is a command line software (C++) !!!

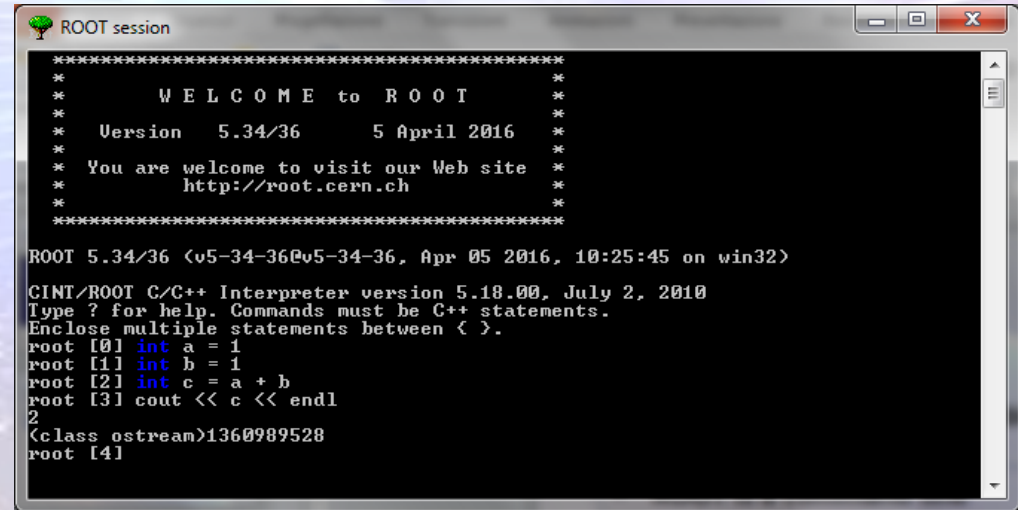
Try to type:

```
int a=1
```

```
int b = 1
```

```
int c = a + b
```

```
cout << c << endl
```



```
ROOT session
*****
*          W E L C O M E  t o  R O O T          *
*          Version  5.34/36      5 April 2016    *
*  You are welcome to visit our Web site      *
*          http://root.cern.ch                *
*****
ROOT 5.34/36 (v5-34-36@v5-34-36, Apr 05 2016, 10:25:45 on win32)
CINT/ROOT C/C++ Interpreter version 5.18.00, July 2, 2010
Type ? for help. Commands must be C++ statements.
Enclose multiple statements between { }.
root [0] int a = 1
root [1] int b = 1
root [2] int c = a + b
root [3] cout << c << endl
2
(class ostream)1360989528
root [4]
```

- First basic commands:

```
.q
```

```
new TBrowser()
```

Quit ROOT

Open a browser to inspect files

READ EEE DATA WITH ROOT

- Submit a query: iatw.cnaf.infn.it/eee/elog/Query
(check the data quality on the EEE DQM page)



Browser address bar: iatw.cnaf.infn.it/eee/elog/Query/

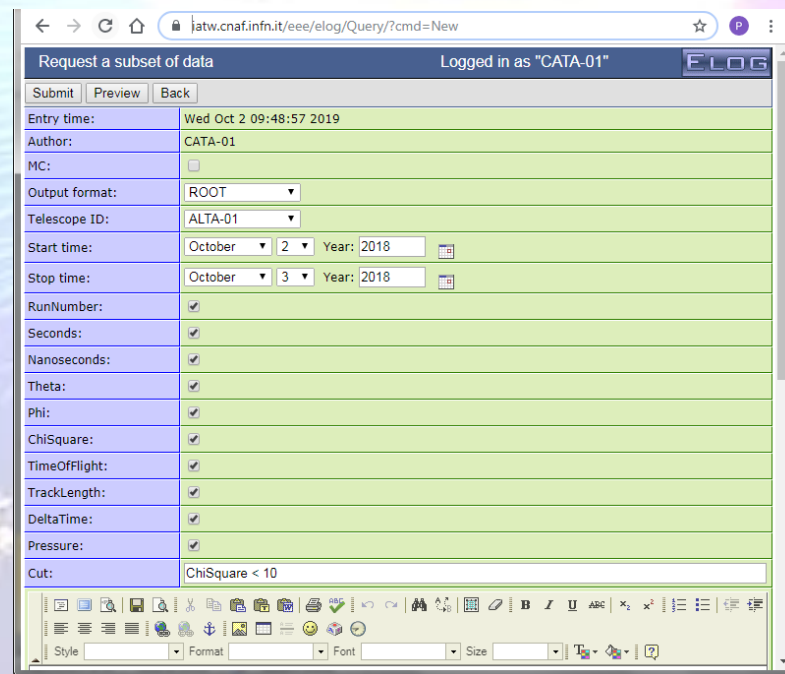
Please login

Username:

Password:

Keep me logged in on this computer for the next 31 days or until I log out

ELOG V2.9.2-2466



Browser address bar: iatw.cnaf.infn.it/eee/elog/Query/?cmd=New

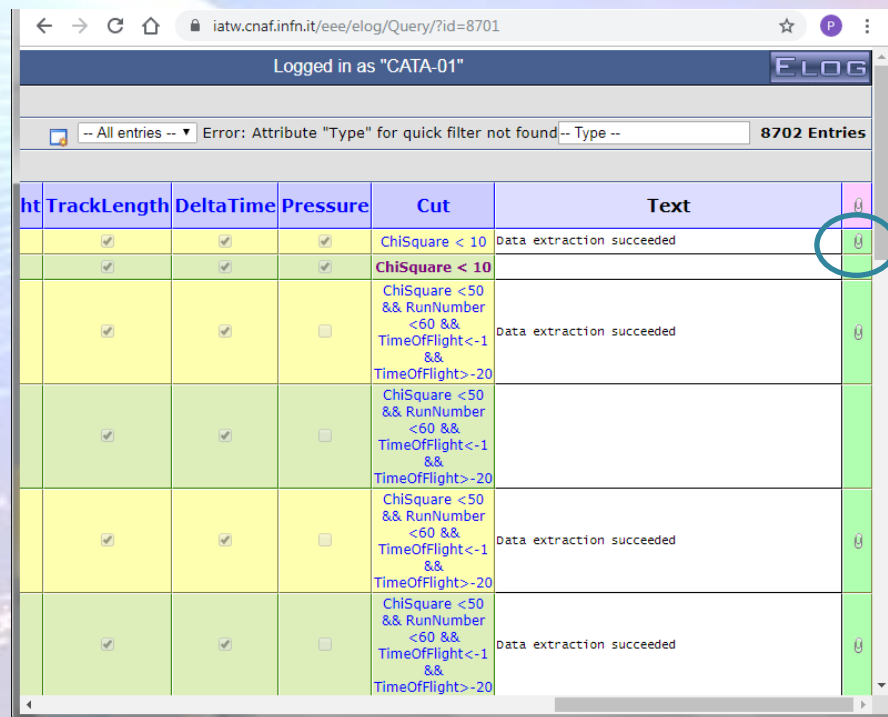
Logged in as "CATA-01" ELOG

Buttons:

| | |
|----------------|-------------------------------------|
| Entry time: | Wed Oct 2 09:48:57 2019 |
| Author: | CATA-01 |
| MC: | <input type="checkbox"/> |
| Output format: | ROOT |
| Telescope ID: | ALTA-01 |
| Start time: | October 2 Year: 2018 |
| Stop time: | October 3 Year: 2018 |
| RunNumber: | <input checked="" type="checkbox"/> |
| Seconds: | <input checked="" type="checkbox"/> |
| Nanoseconds: | <input checked="" type="checkbox"/> |
| Theta: | <input checked="" type="checkbox"/> |
| Phi: | <input checked="" type="checkbox"/> |
| ChiSquare: | <input checked="" type="checkbox"/> |
| TimeOfFlight: | <input checked="" type="checkbox"/> |
| TrackLength: | <input checked="" type="checkbox"/> |
| DeltaTime: | <input checked="" type="checkbox"/> |
| Pressure: | <input checked="" type="checkbox"/> |
| Cut: | ChiSquare < 10 |





READ EEE DATA WITH ROOT

- Download the requested ROOT file
- Unzip the file



Logged in as "CATA-01" ELOG

-- All entries -- Error: Attribute "Type" for quick filter not found-- Type -- 8702 Entries

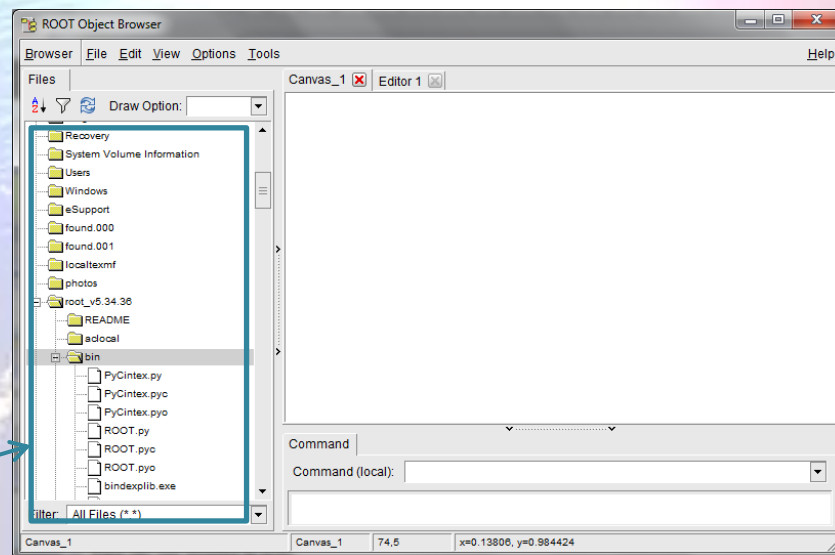
| ht | TrackLength | DeltaTime | Pressure | Cut | Text | |
|----|-------------------------------------|-------------------------------------|-------------------------------------|--|---------------------------|---|
| | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | ChiSquare < 10 | Data extraction succeeded |  |
| | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | ChiSquare < 10 | | |
| | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ChiSquare < 50 && RunNumber < 60 && TimeOfFlight < -1 && TimeOfFlight > -20 | Data extraction succeeded |  |
| | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ChiSquare < 50 && RunNumber < 60 && TimeOfFlight < -1 && TimeOfFlight > -20 | | |
| | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ChiSquare < 50 && RunNumber < 60 && TimeOfFlight < -1 && TimeOfFlight > -20 | Data extraction succeeded |  |
| | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | ChiSquare < 50 && RunNumber < 60 && TimeOfFlight < -1 && TimeOfFlight > -20 | Data extraction succeeded |  |

THE ROOT BROWSER

The ROOT files are not human-readable, they can be read using ROOT

- Double-click on the ROOT file icon
- OR
- Type *new TBrowser()* in a ROOT terminal and navigate to your ROOT file

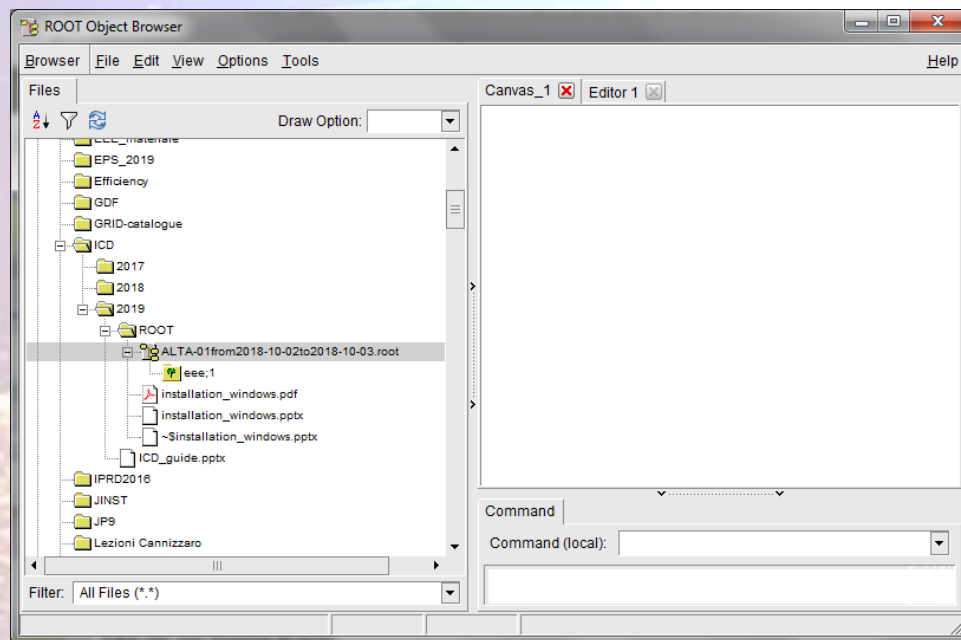
```
ROOT session
*****
*          WELCOME to ROOT          *
*  Version  5.34/36    5 April 2016  *
*  You are welcome to visit our Web site *
*          http://root.cern.ch       *
*****
ROOT 5.34/36 (v5-34-36@v5-34-36, Apr 05 2016, 10:25:45 on win32)
CINT/ROOT C/C++ Interpreter version 5.18.00, July 2, 2010
Type ? for help. Commands must be C++ statements.
Enclose multiple statements between { }.
root [0]
root [0] new TBrowser()
(class TBrowser*)0x37db5b8
root [1]
```



browse

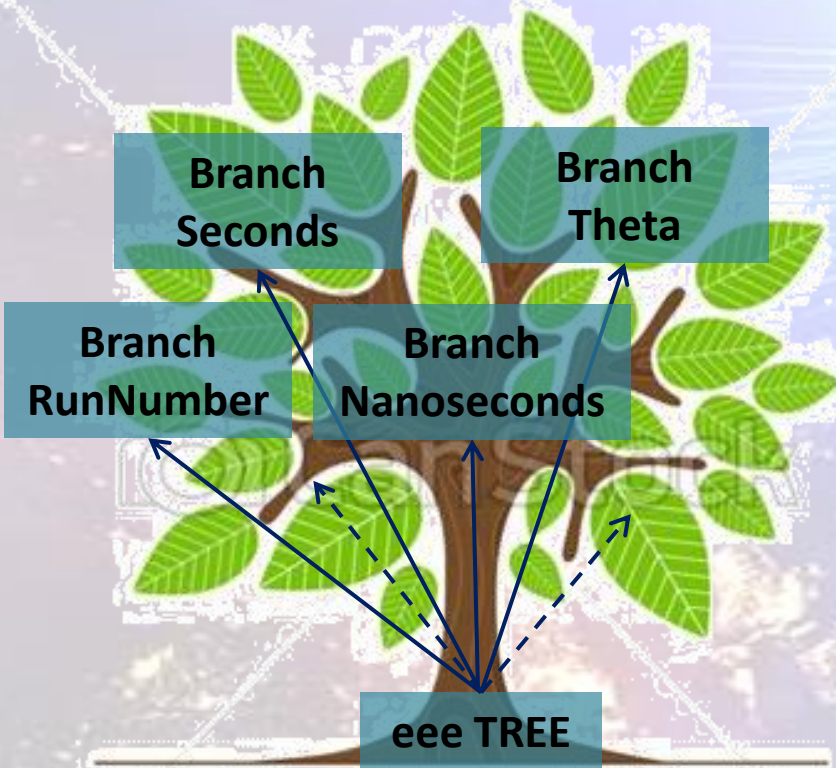
THE ROOT BROWSER

- Double-click on the ROOT file name (left panel in the Browser)
- The content of the file will be shown: **tree eee**



eee TREE

- Double-click on the eee tree: the content of the tree will be displayed

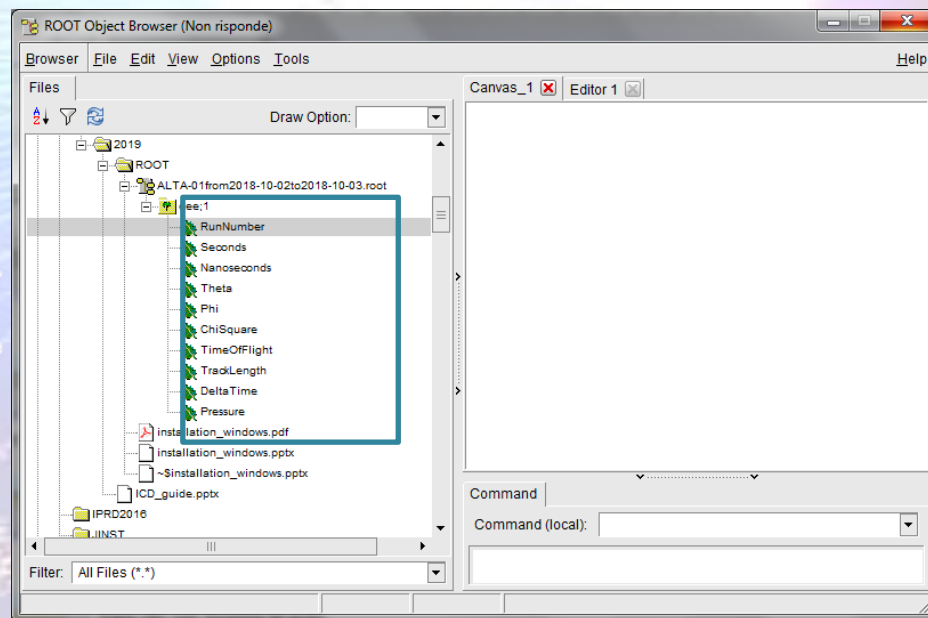
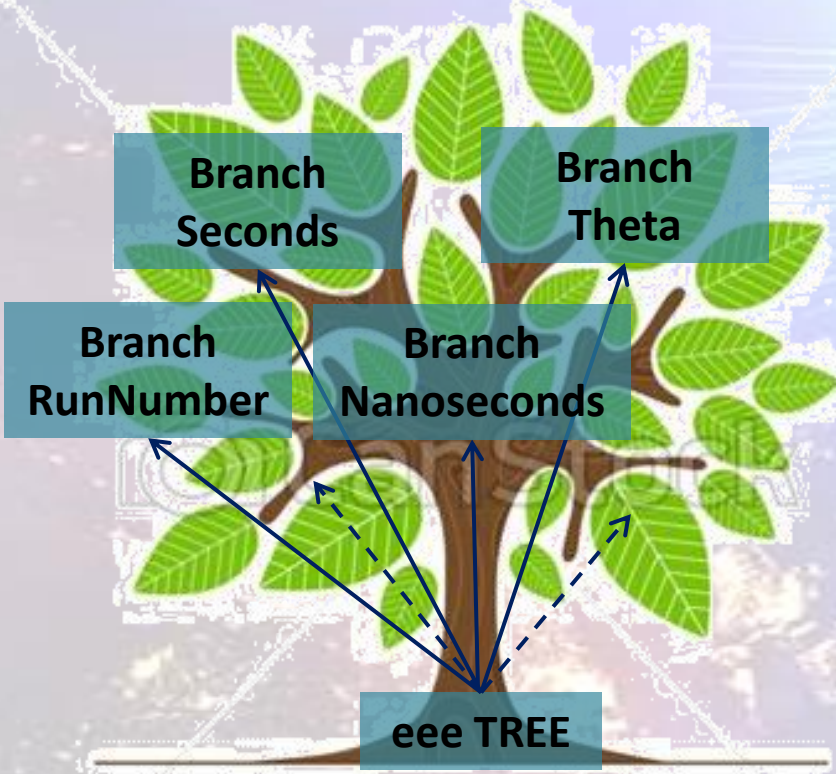


EEE data structure:

| Ev | RunNumber | Seconds | Nanoseconds | Theta... |
|----|-----------|-----------|-------------|--------------|
| 0 | 1 | 370822512 | 33036407 | 23,945133... |
| 1 | 1 | 370822512 | 54031619 | 10,268568... |
| 2 | ... | | | |

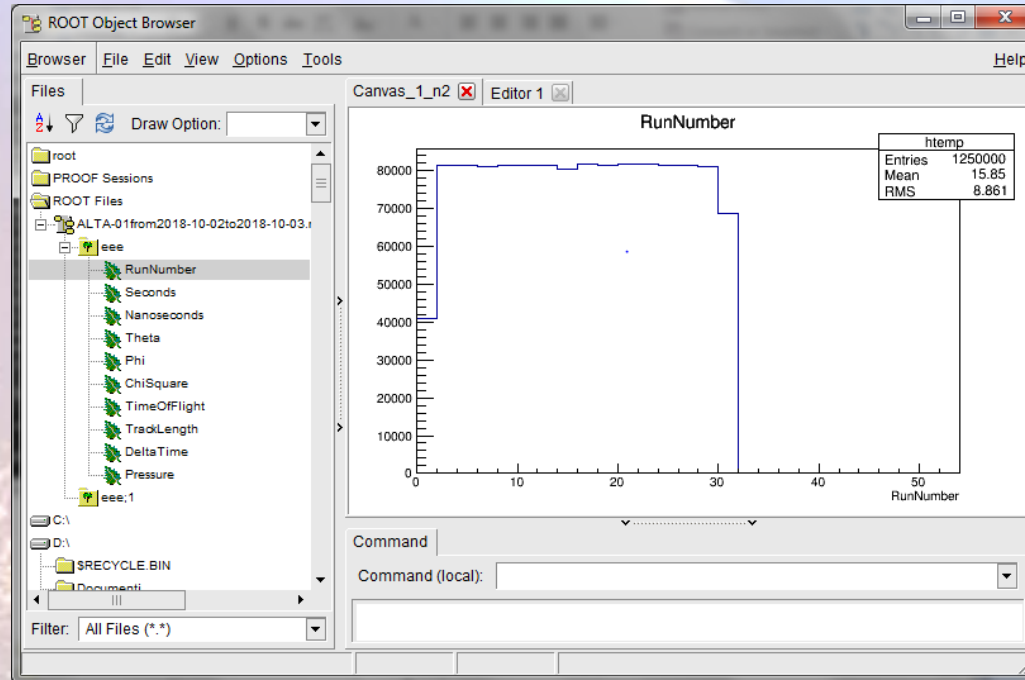
eee TREE

- Double-click on the eee tree: the content of the tree will be displayed



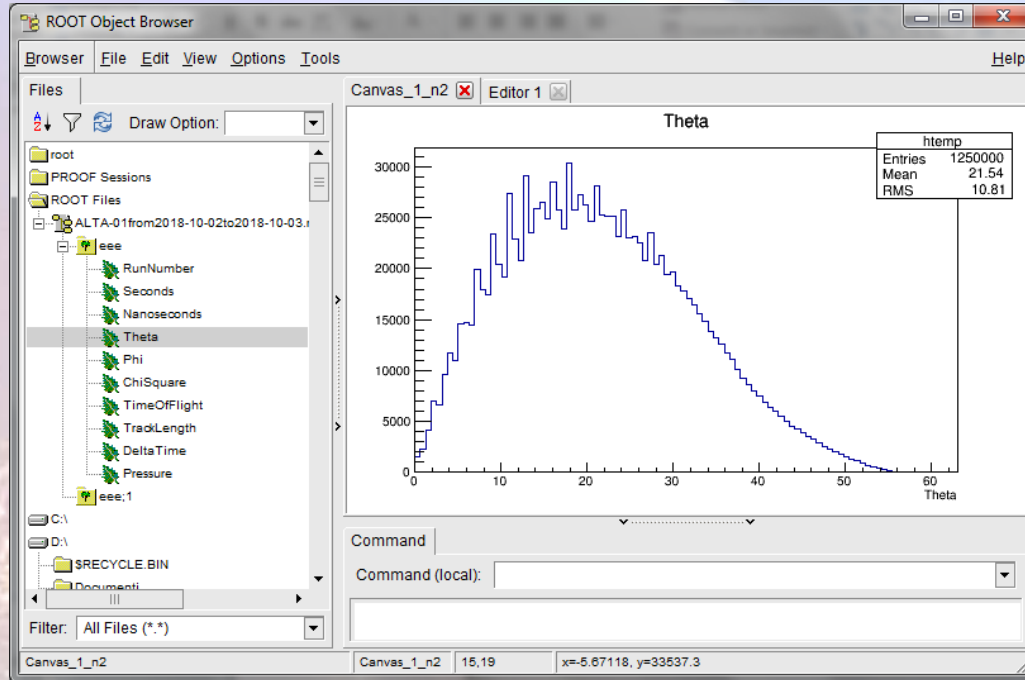
eee TREE

- Double-click on the eee branches: an histogram will be displayed



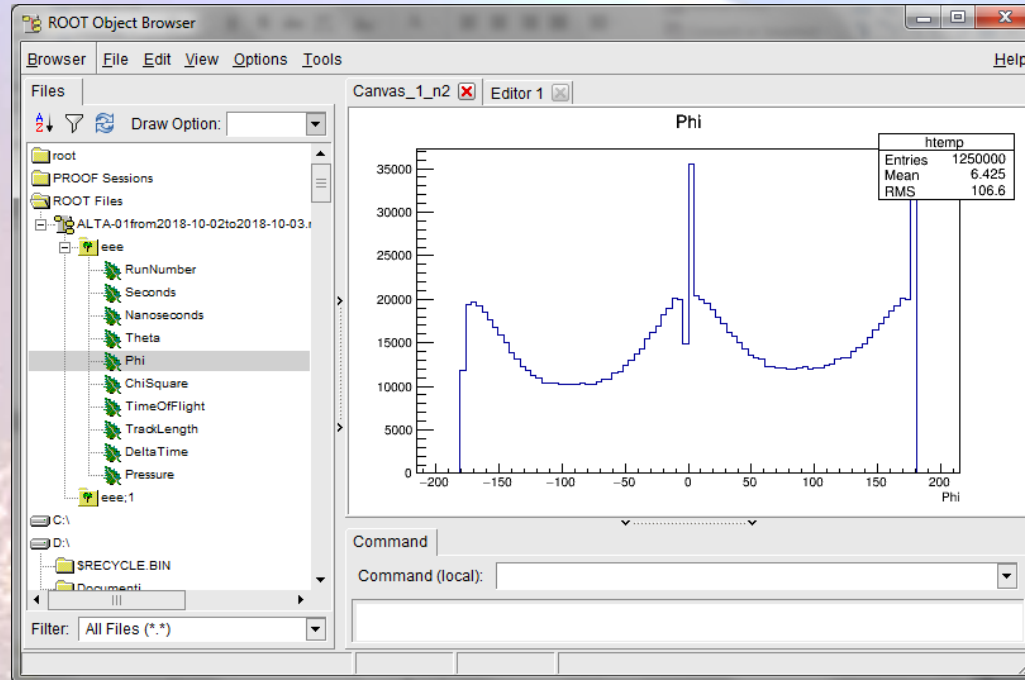
eee TREE

- Double-click on the eee branches: an histogram will be displayed



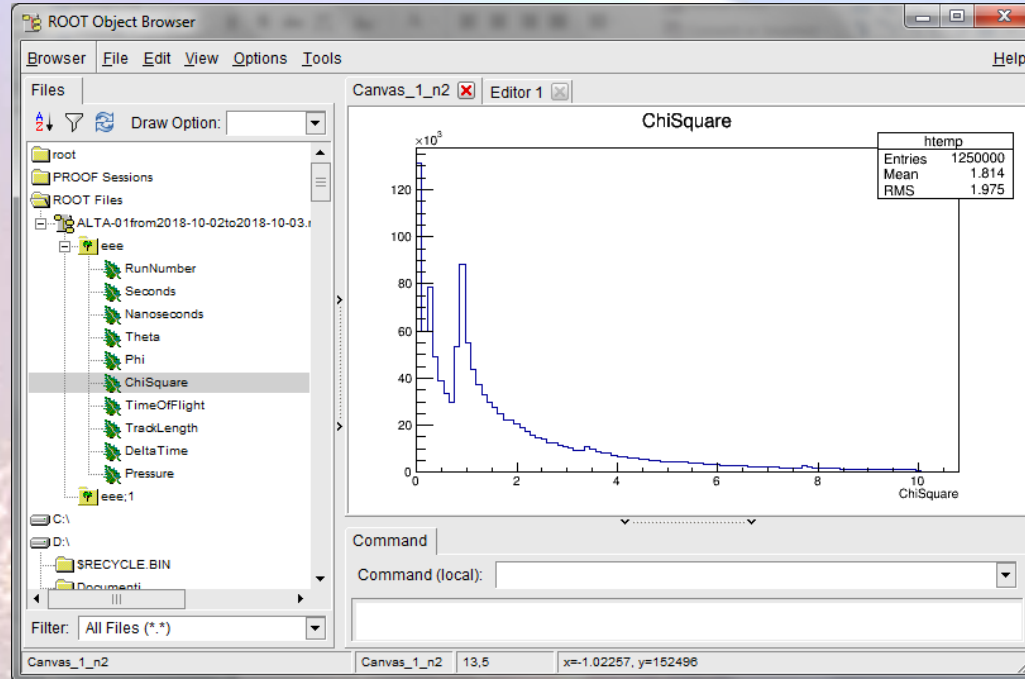
eee TREE

- Double-click on the eee branches: an histogram will be displayed



eee TREE

- Double-click on the eee branches: an histogram will be displayed



IS EVERYTHING FINE?

- **YES... Now you are ready to use ROOT!**
- **NO: Contact your EEE referent 😊**
- **Additional instructions will be provided during the next Run Coordination Meeting**

