

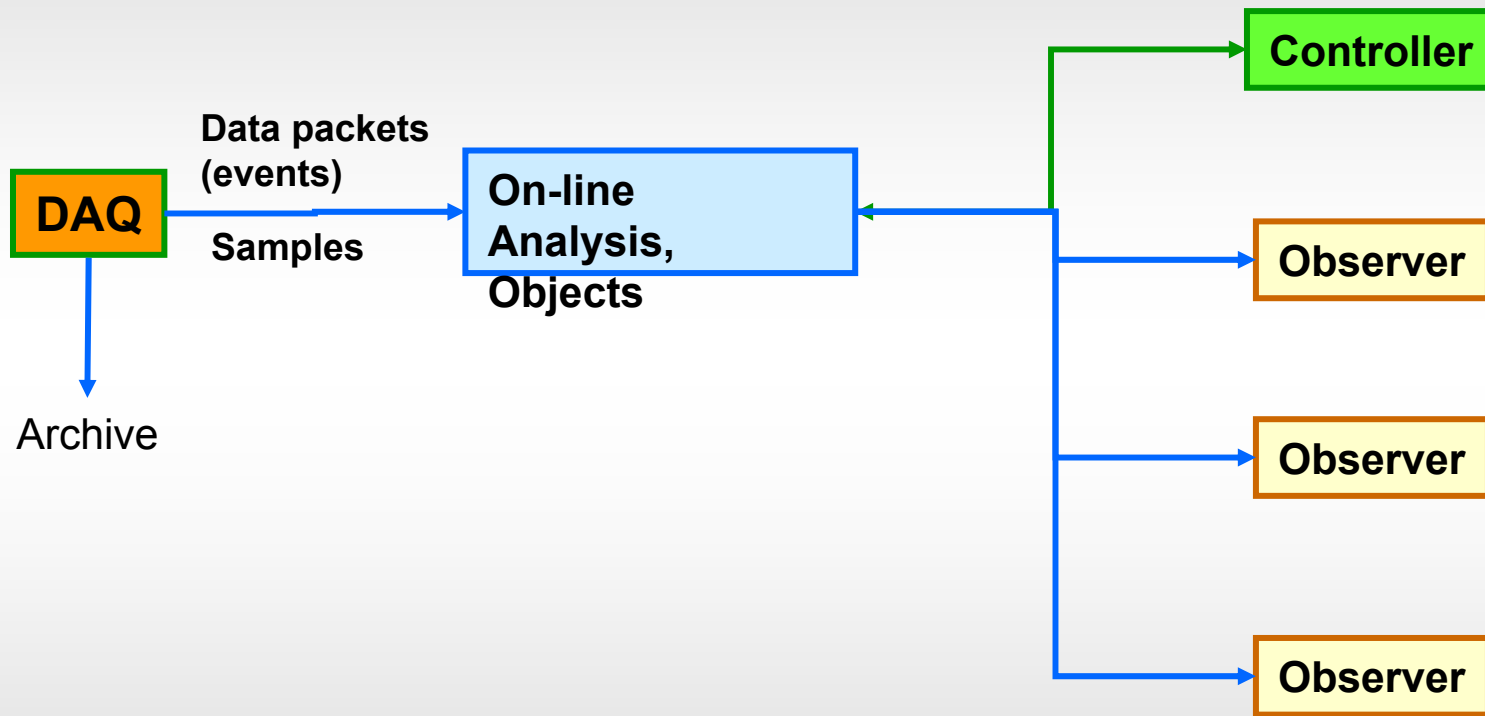


Go4 Version 4.4

On-line object monitoring

On-line object monitoring with new version v4.4 of Go4

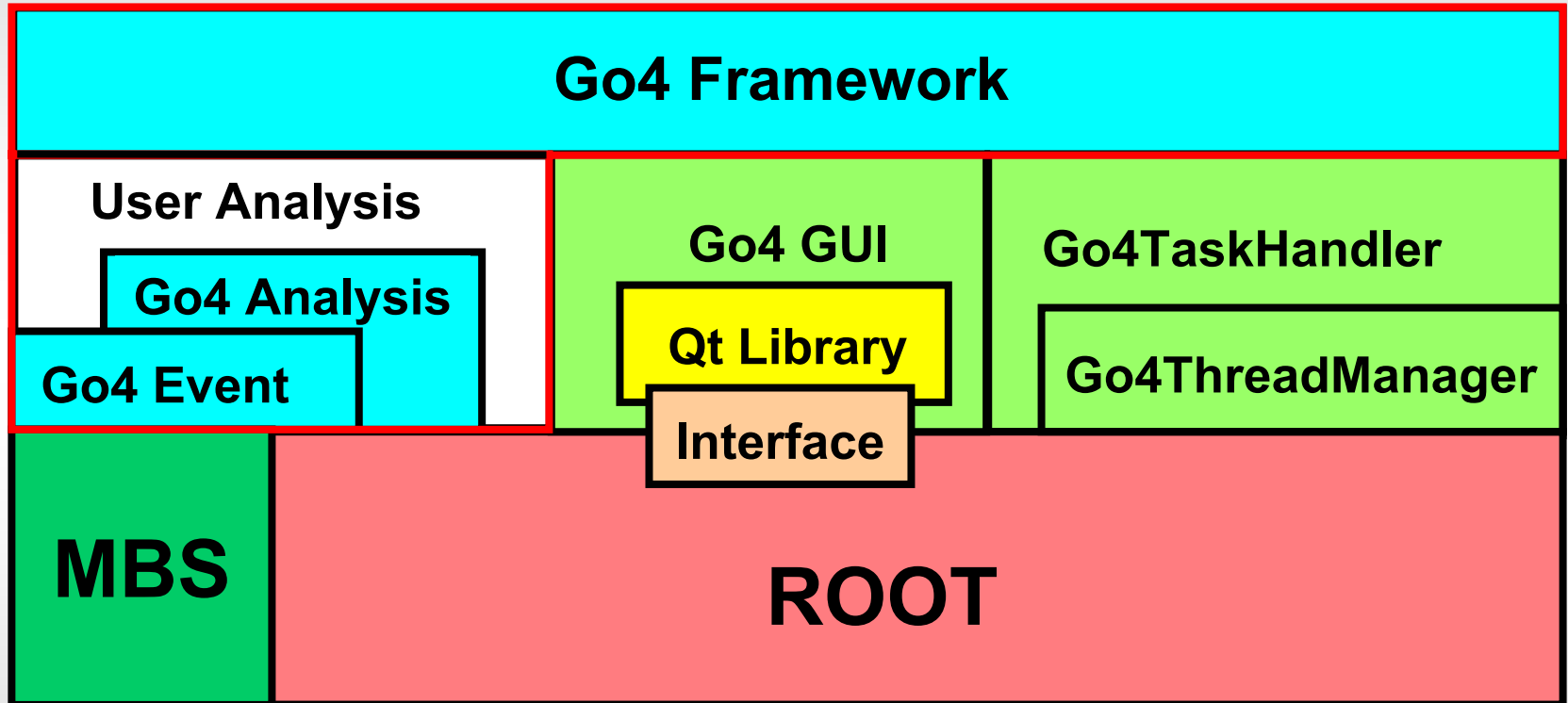
J.Adamczewski-Musch, H.G.Essel, S.Linev
GSI, experiment electronics





- Go4 is a framework for many kinds of experiments (Atomic & Nuclear Physics)
- The analysis is written by the user (C++, unlimited ROOT)
- Linux, Solaris, Windows XP, W7, Mac
- Go4 provides services and interfaces for analysis
- It runs in batch mode (CINT or compiled, on/off-line)
- or interactive mode (on/off-line):
 - Non blocking Qt4 GUIs control and steer the analysis
 - The analysis runs independently and can update graphics asynchronously
 - ROOT objects are transported between analysis and GUI task
 - One controller, multiple viewers at one analysis server
 - Macro execution in GUI or remote analysis
 - ROOT and Qt graphics are interfaced
 - User may create specific GUIs (Qt designer)

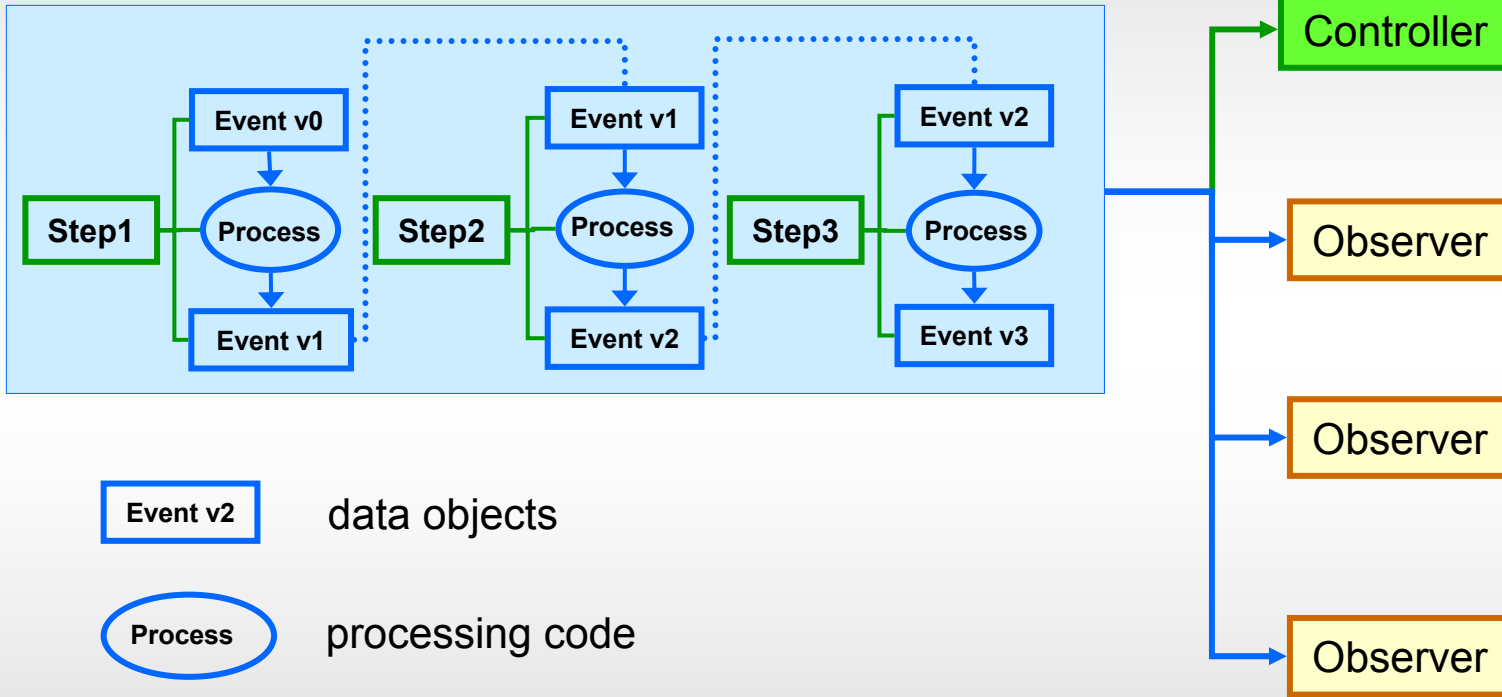
Go4 well established as GSI “standard” analysis framework



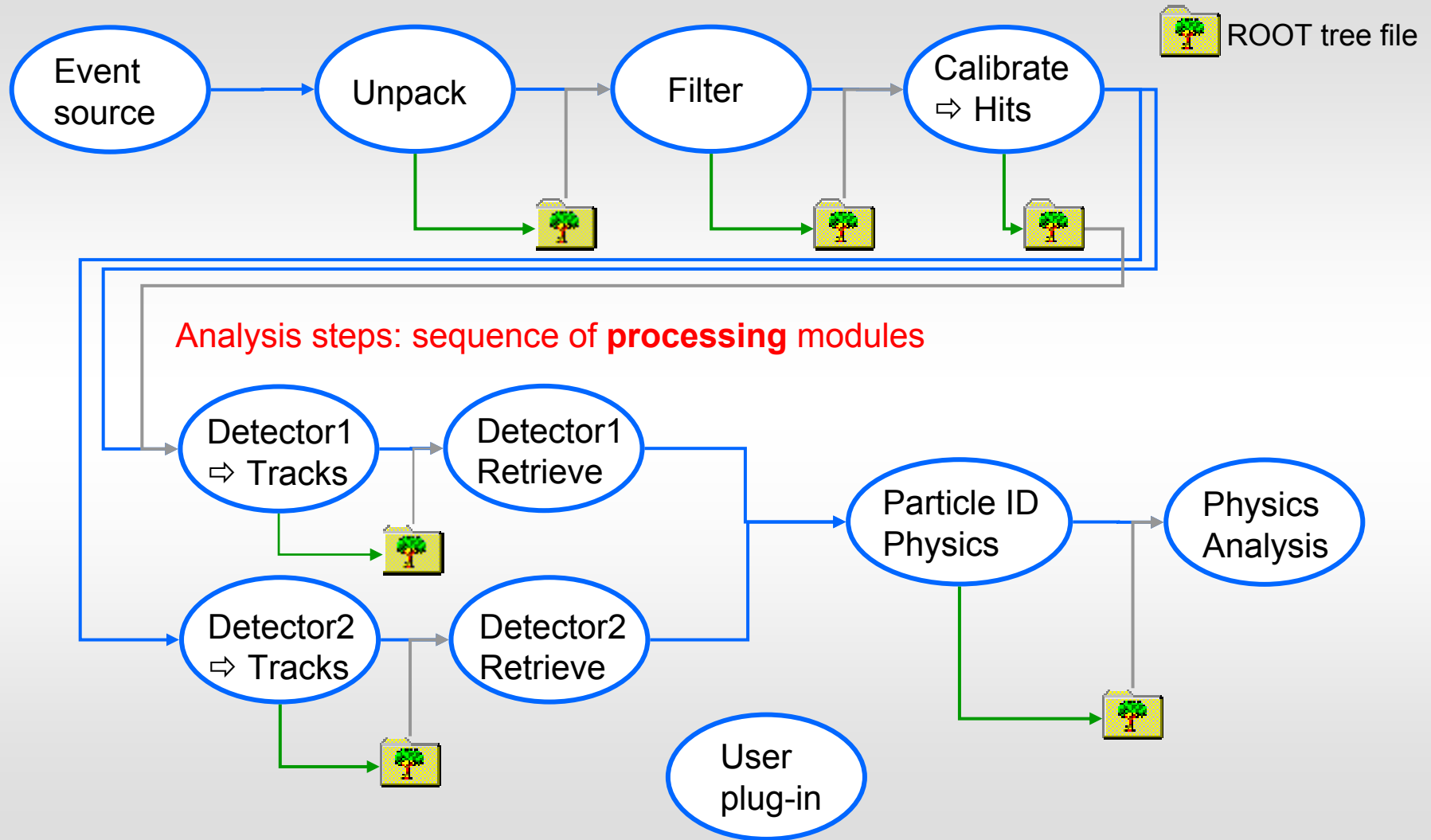


- **Development start:** **April 1999**
- Go4 v.1.0 May 2002
- Go4 v.2.0 November 2002
- Go4 v.2.10 June 2005
- Go4 v.3.0 December 2005
- **Go4 v.4.4 May 2010**
- **Users:**
 - **At GSI:** FRS, SHIP, AP, ESR, Rising, HypHi, HADES online, TASCA...
 - **Outside:** TU Darmstadt, Uni Mainz, Uni Giessen, INFN Milano, Weizman institute, IMPCAS,...

Modular analysis, ROOT based



Go4 analysis: processing modules





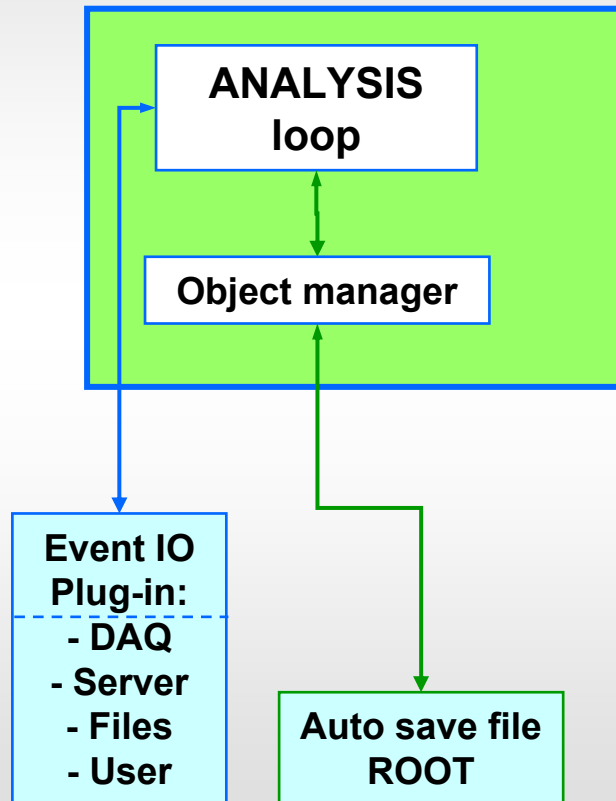
- Histograms
- Conditions
 - **window condition**: check 1 (2) value(s) against 2 limits (pairs of limits)
 - **polygon condition**: check if point (x,y) is inside/outside polygon
 - indexable arrays of conditions
 - allows for analysis **flow control**
 - **statistics** (true/false counters)
 - **interactive control** (GUI editor) (freeze)
- Parameters
 - **User classes** keeping parameter variables
 - **interactive control** (generic GUI editor)
 - value protection (update can be controlled by user function)
 - allows for specific **analysis control**
 - **"cheap" commands** (executed through editor) easy to implement
 - supports besides **atomic data** types also **fit objects**

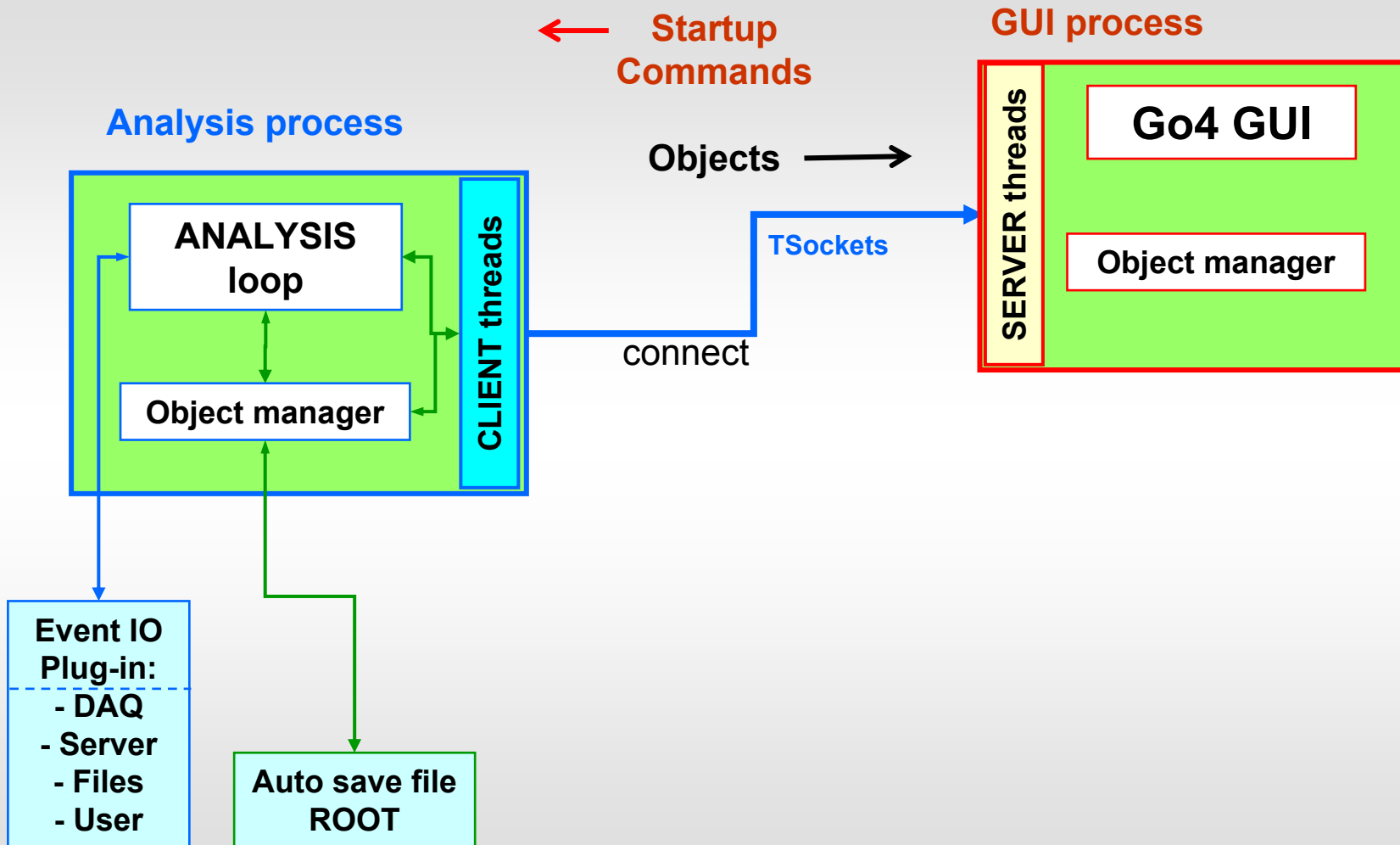
Stored / restored in / from auto-save file.

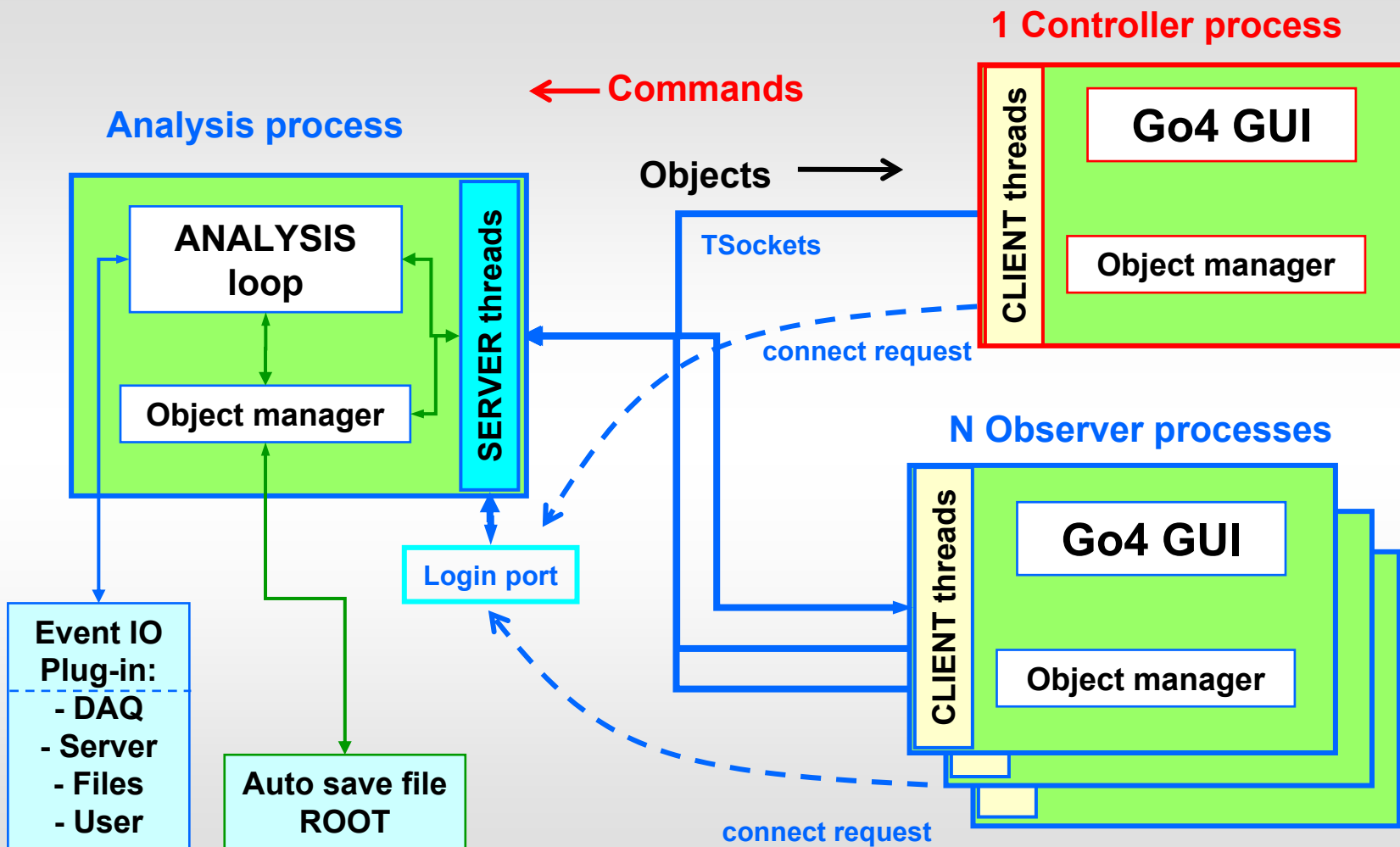


Set up in code or macros

Analysis process



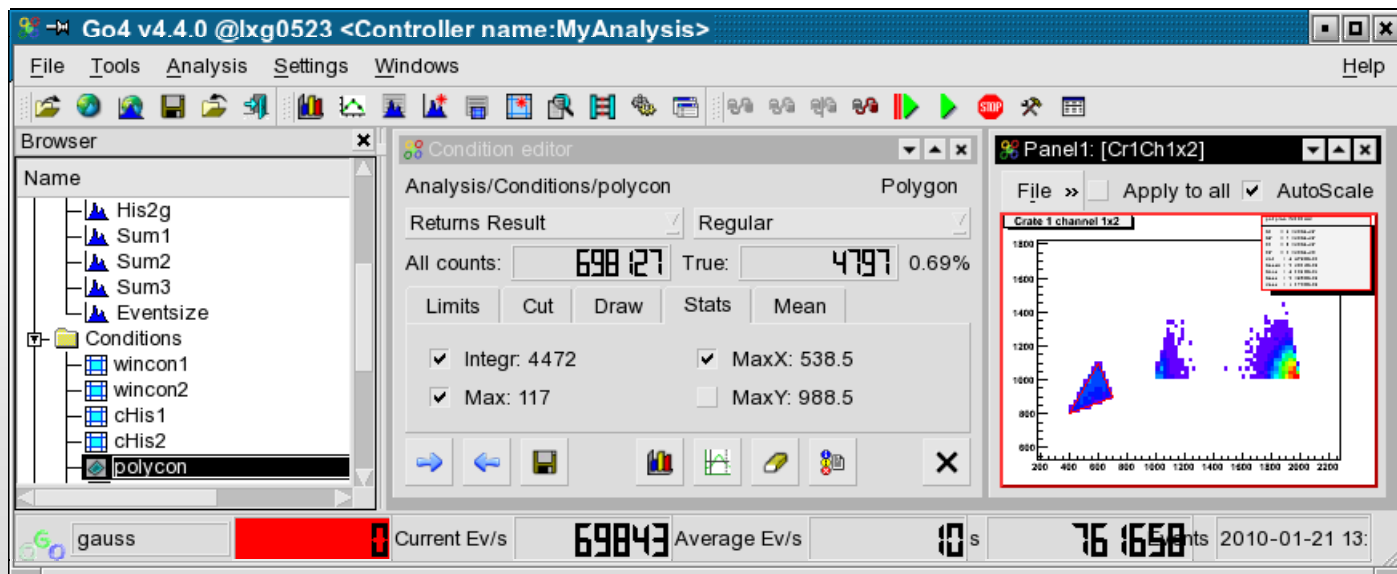
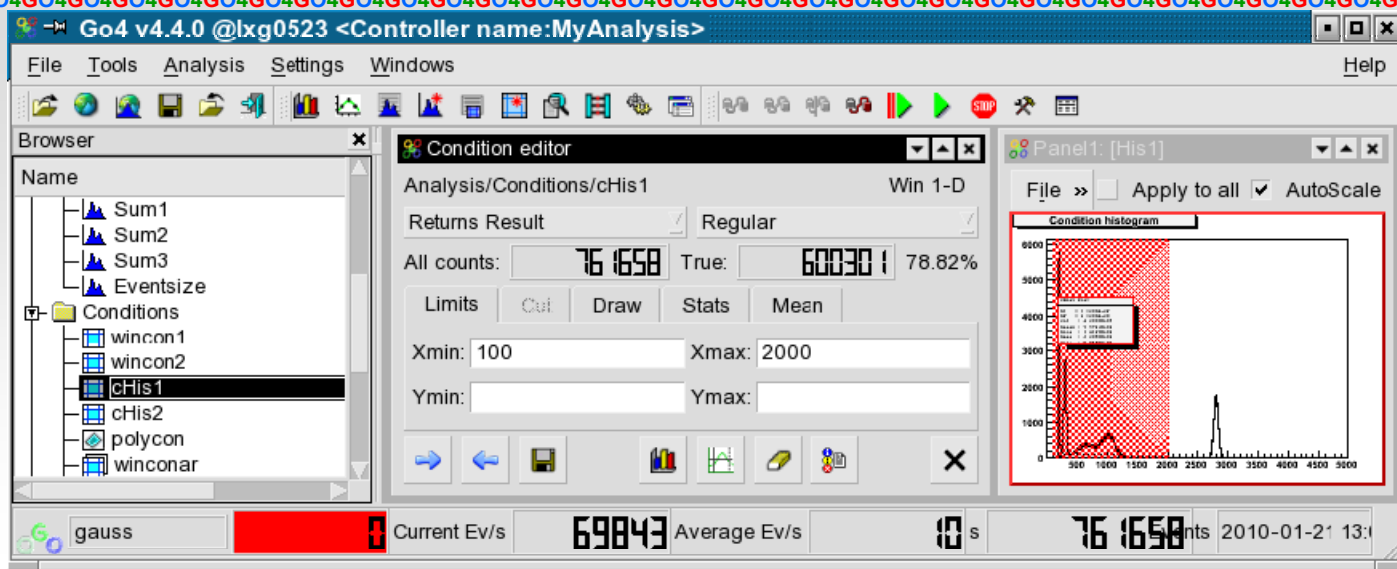




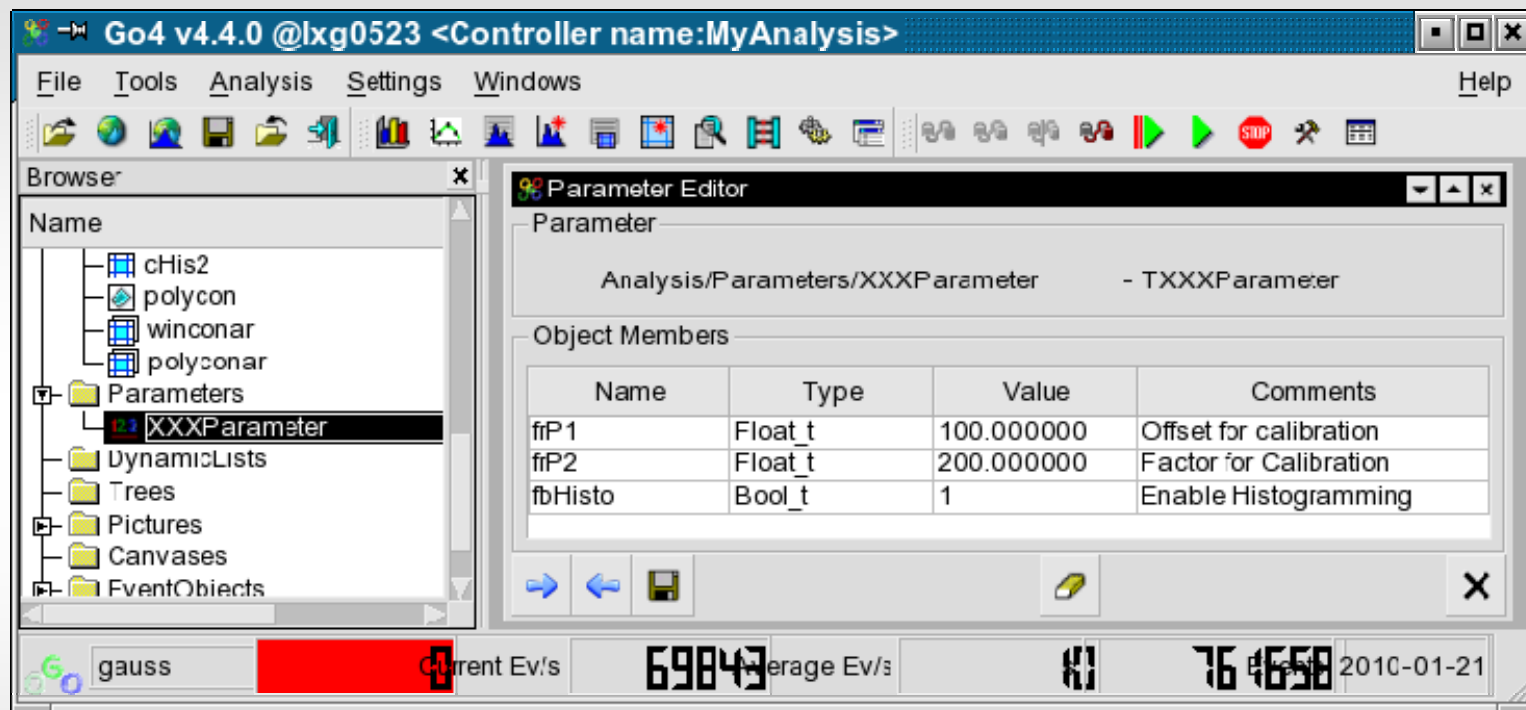




Go4 GUI: Condition editor



Remote editing of object (data structure) contents





Go4 GUI: Local and remote Macro execution

Go4 v4.4.1 @lxg0523 <Administrator name:Monitor>

File Tools Analysis Settings Windows Help

GUI command: `rebin("Workspace/pm200058raw", 4, 10, kFALSE);`

@PrintHistograms()

Browser

- Workspace
- Analysis
 - Histograms
 - Conditions
 - win con1
 - win con2
 - cHis1
 - cHis2
 - polycon
 - winconar
 - polyconar
 - Parameters
 - XXXParameter
 - DynamicLists
 - Trees
 - Pictures
 - Canvases
 - EventObjects

Go4Server:Monitor@localhost

```
++++End Crate1+++++++
+Folder Crate2 content:
TH1.Print Name = Cr2Ch01, Entries= 64690731, Total sum= 6.46906e+07
TH1.Print Name = Cr2Ch02, Entries= 59299104, Total sum= 5.92491e+07
TH1.Print Name = Cr2Ch03, Entries= 48514963, Total sum= 4.8515e+07
TH1.Print Name = Cr2Ch04, Entries= 37703161, Total sum= 3.74495e+07
TH1.Print Name = Cr2Ch05, Entries= 26689324, Total sum= 2.66893e+07
TH1.Print Name = Cr2Ch06, Entries= 16175697, Total sum= 1.61756e+07
TH1.Print Name = Cr2Ch07, Entries= 5390644, Total sum= 4.45922e+06
TH1.Print Name = Cr2Ch08, Entries= 0, Total sum= 0
++++End Crate2+++++++
TH1.Print Name = Cr1Ch1x2, Entries= 1820109, Total sum= 1.82011e+06
TH1.Print Name = His1, Entries= 64690729, Total sum= 6.46906e+07
TH1.Print Name = His2, Entries= 59298306, Total sum= 5.92482e+07
TH1.Print Name = His1g, Entries= 50942677, Total sum= 5.09427e+07
TH1.Print Name = His2g, Entries= 41219401, Total sum= 4.12194e+07
TH1.Print Name = Sum1, Entries= 292431308, Total sum= 2.92431e+08
TH1.Print Name = Sum2, Entries= 420408150, Total sum= 4.19834e+08
TH1.Print Name = Sum3, Entries= 420408150, Total sum= 4.19786e+08
TH1.Print Name = Eventsiz, Entries= 64690736, Total sum= 6.46907e+07
++++End Histograms+++++++

-----
Total size of all histograms is: 639428 bytes.
```

/misc/goofy/ Current Ev/s 11090 Average Ev/ 582 64690731 2010-05-1



Update &
Monitor

Local

Remote

File

Go4 v4.1.1 @lxg0523 <Observer name:Monitor>

File Tools Analysis Settings Windows Help

2 s All items

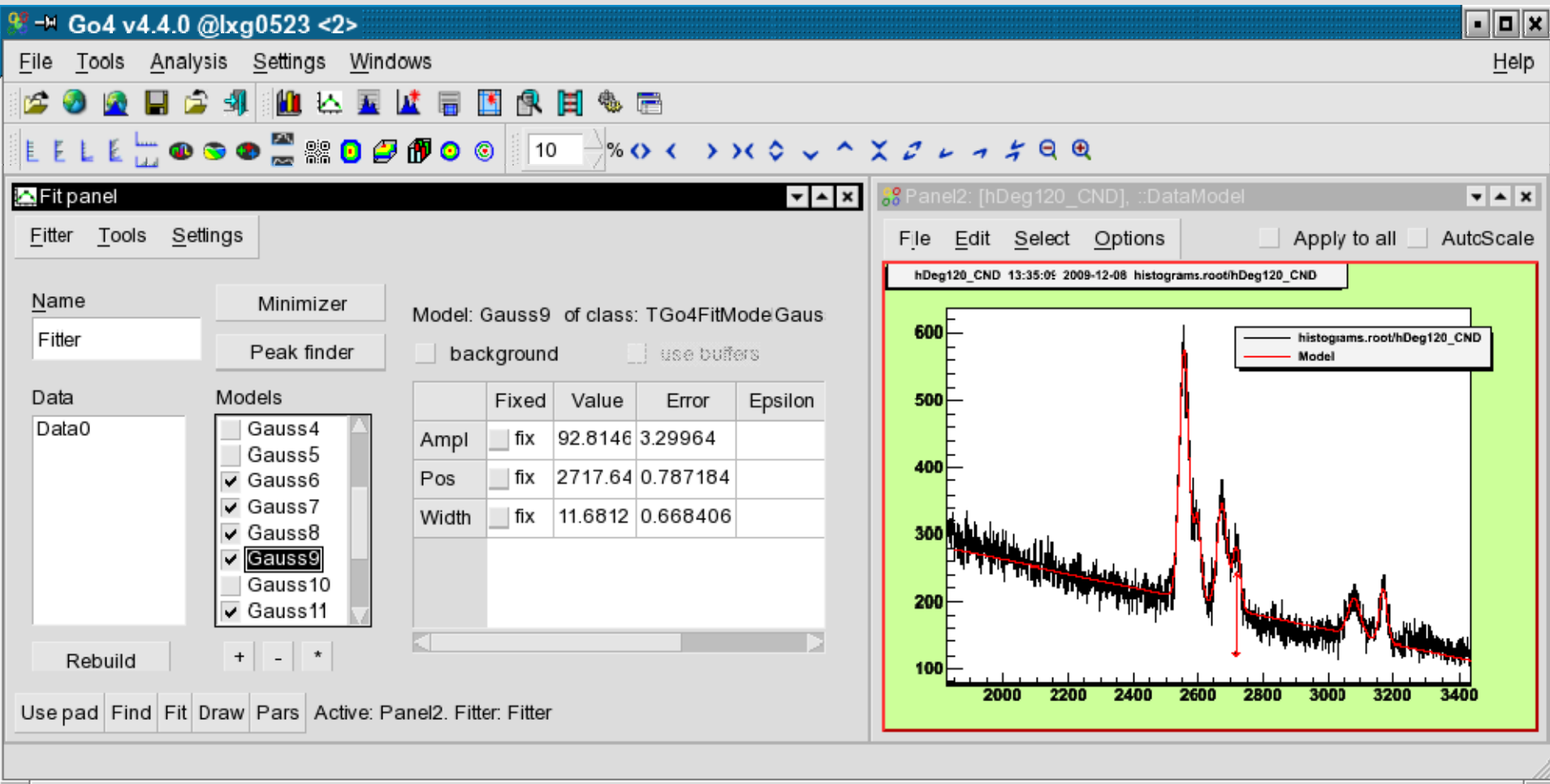
Name	Info	Class	Size
Workspace	folder		= 41232
Backup	folder		= 40
XXXParameter	This is a Go4 Parameter Object	TXXXParam...	40
Analysis	folder		= 20596
Histograms	folder		= 20596
His1	Condition histogram	TH1I	20596
gauss_AS.root	folder		= 20596
Histograms	folder		= 20596
His1	Condition histogram	TH1I	20596
Analysis	Observer name:Monitor	TGo4Analysi...	= 646703
Histograms	All Histogram objects	TFolder	= 639428
Conditions	All Condition objects	TFolder	= 1068
Parameters	All Parameter objects	TFolder	= 40
DynamicLists	Dynamic List Instances	TFolder	
Trees	References to trees	TFolder	
Pictures	Picture objects	TFolder	= 5775
Canvases	All TCanvases	TFolder	
EventObjects	Event objects of current analysis	TFolder	= 392
UserObjects	For User Objects	TFolder	
gauss_AS.root	TFile		21936
Histograms	subdir	TDirectoryFile	= 28183
Conditions	subdir	TDirectoryFile	= 2063
Parameters	subdir	TDirectoryFile	= 165
XXXParameter	This is a Go4 Parameter Object	TXXXParam...	165
DynamicLists	subdir	TDirectoryFile	
Pictures	subdir	TDirectoryFile	= 1062
Canvases	subdir	TDirectoryFile	
UserObjects	subdir	TDirectoryFile	

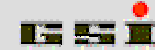
Plot
Superimpose
Fetch item(s)
Save selected...
Export to
Info...
Edit...
Delete item
Copy to Workspace
Copy to clipboard
Monitor item(s)
Stop item(s) monitoring
Clear (Reset to 0)
Set Clear protection
Unset Clear protection
Delete from analysis
Refresh namelist

/misc/goofy/awc Current Ev/s 11090 Average Ev/s 582 s 64690736 2010-05-17 14



Interactive peak finding and fitting. Save fitter for use in macros





IEEE Real Time conference history (~30 years)

1979	RT-01 Sante Fe	(Dennis Perry, conference chair)
1981	RT-02 Oak Ridge	(Dave Hensley, conference chair)
1983	RT-03 Berkeley	(Creve Maples, conference chair)
1985	RT-04 Chicago	(Lester Welch, conference chair)
1987	RT-05 San Francisco	(Dennis O'Brien, conference chair)
1989	RT-06 Williamsburg	(Roy Whitney, conference chair)
1991	RT-07 Julich	(Klaus Mueller, conference chair)
1993	RT-08 Vancouver	(Renee Poutissou, conference chair)
1995	RT-09 East Lansing	(Ron Fox, conference chair)
1997	RT-10 Beaune	(Patrick Le Du, conference chair)
1999	RT-11 Sante Fe	(Tom Kozlowski, conference chair)
2001	RT-12 Valencia,	(Antonio Ferrer, conference chair)
2003	RT-13 Montreal	(Jean Pierre Martin, conference chair)
2005	RT-14 Stockholm	(Richard Jaconsson, conference chair)
2007	RT-15 Batavia	(Margaret Votava, conference chair)
2009	RT-16 Beijing	(Yifang WANG, conference chair)
2010	RT-17 Lisbon	(Carlos Varandas, conference chair)

- **DARSY** DAta Reduction SYstem (DAQ & analysis)
- **GOOSY** Gsi Online Offline SYstem (DAQ & analysis)
- **MBS** Multi Branch System (DAQ)
- **TOM&LEA** Therapy Online Monitor & LEan Analysis
- **GO4** ROOT and Qt based analysis
- **DABC** Data Acquisition Backbone Core



Screenshot of Go4 v4.4

