Go4 Version 4.4

On-line object monitoring

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

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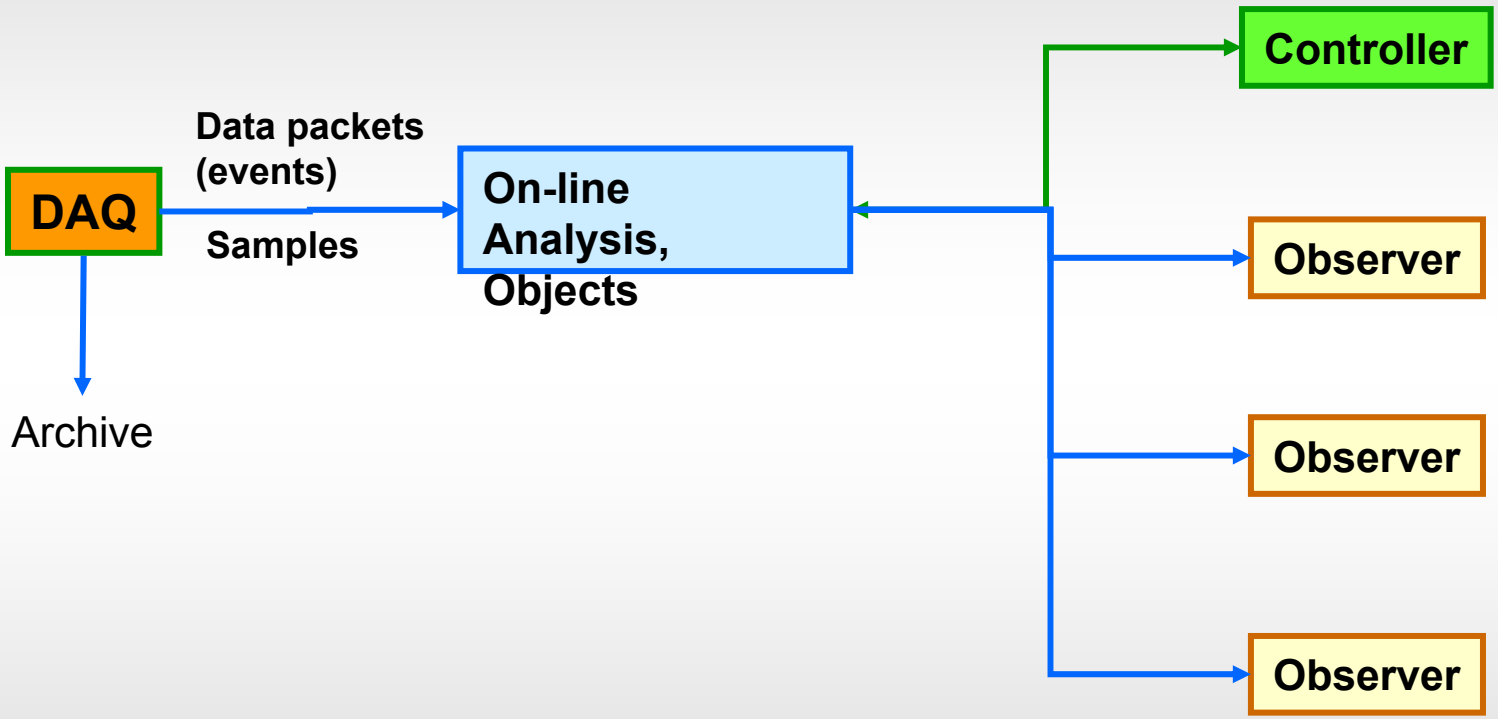
GSI, experiment electronics

Outline

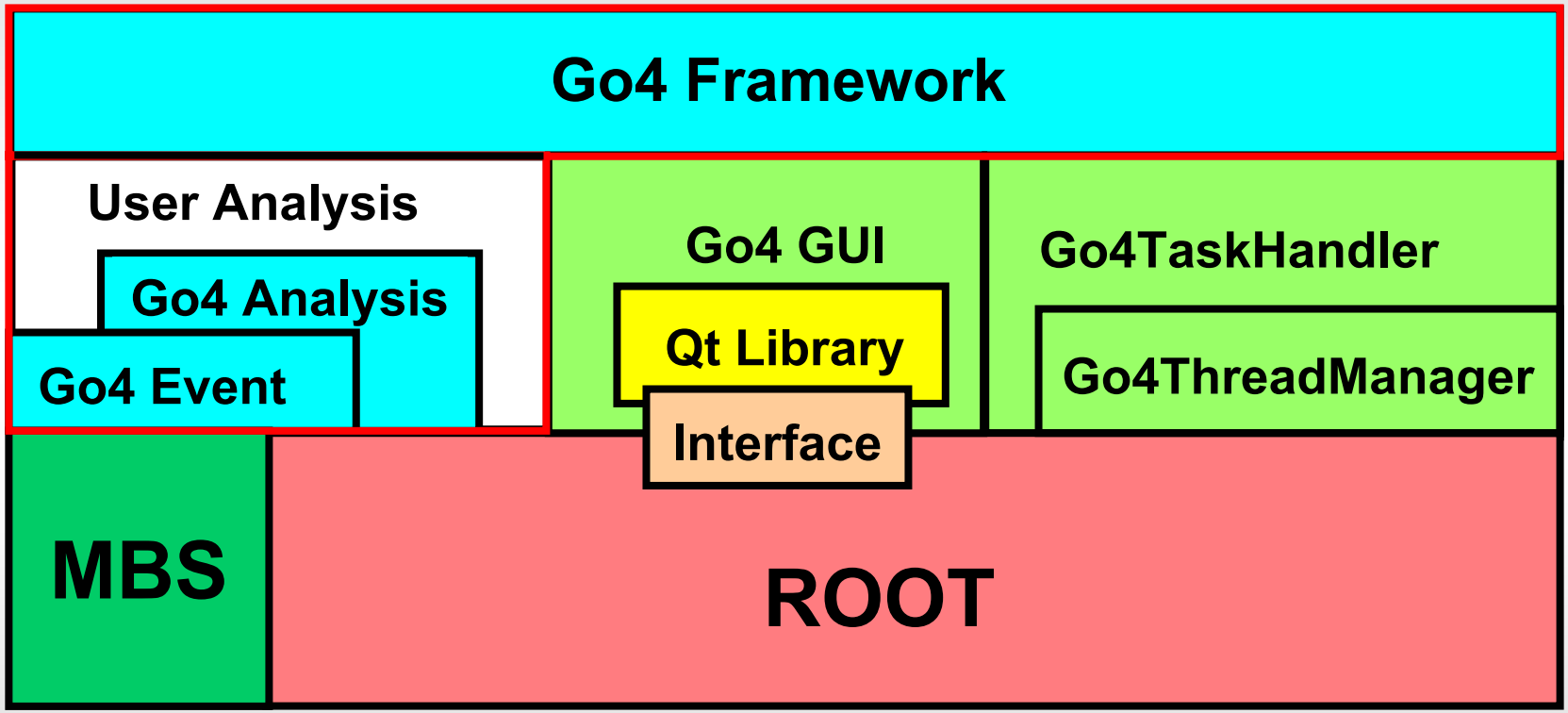

Controller
Data packets
(events)
DAQ
Samples
On-line
Analysis,
Objects
Observer
Observer
Observer
Archive

Go4 features

- 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

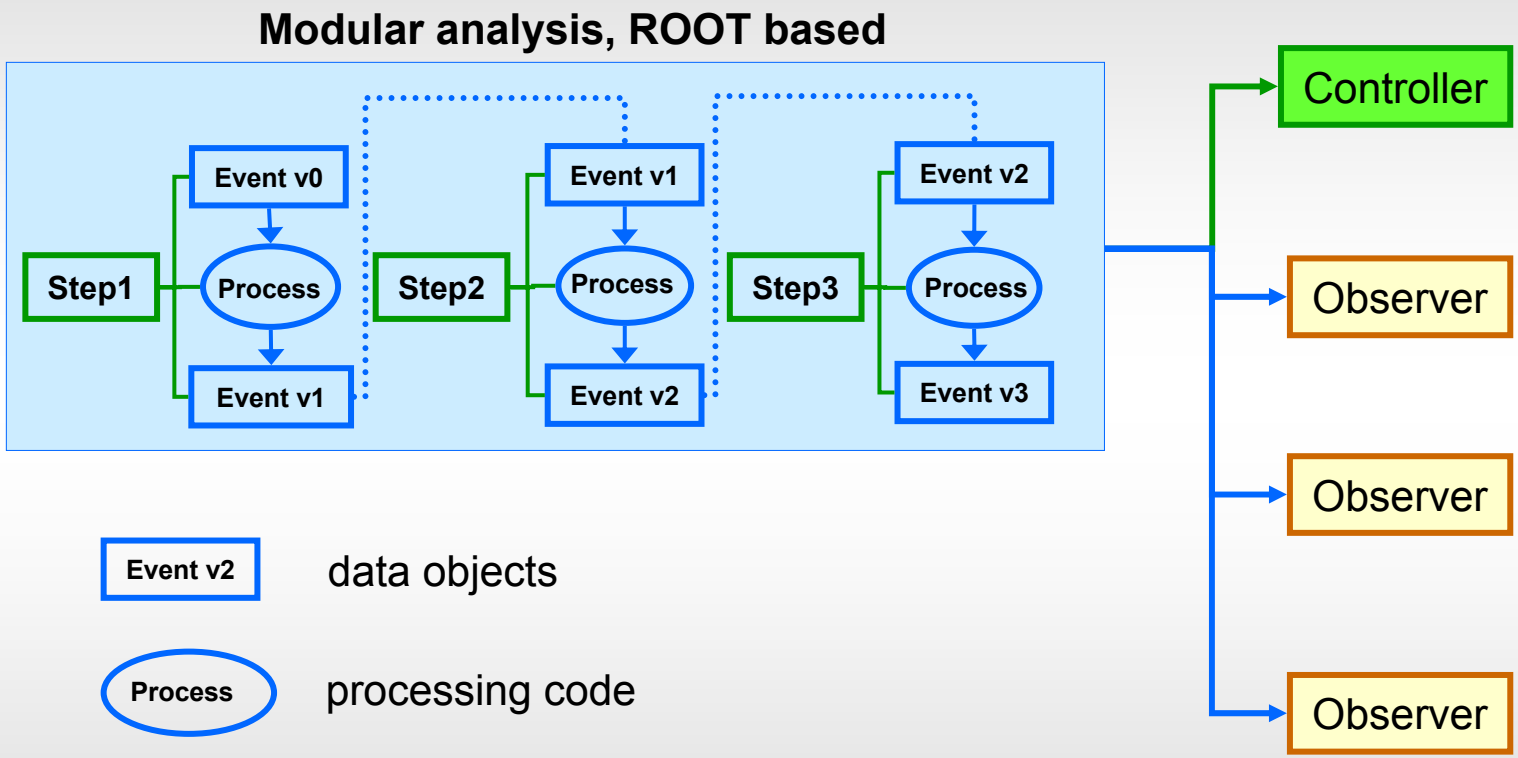
Go4 package layers



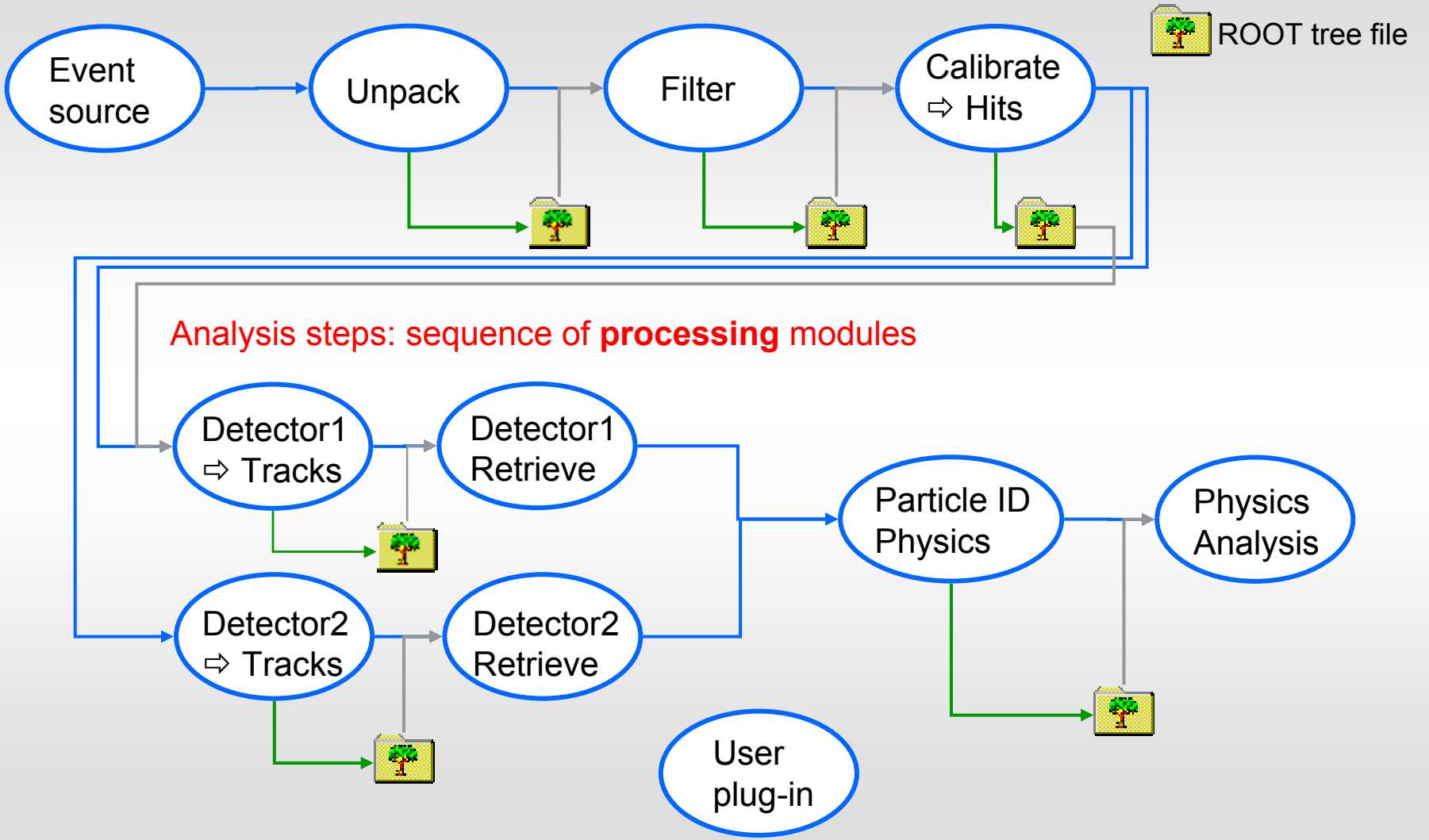
Go4 history and status

- **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,...

Go4 analysis: modular design



Go4 analysis: processing modules



Go4 analysis: object examples

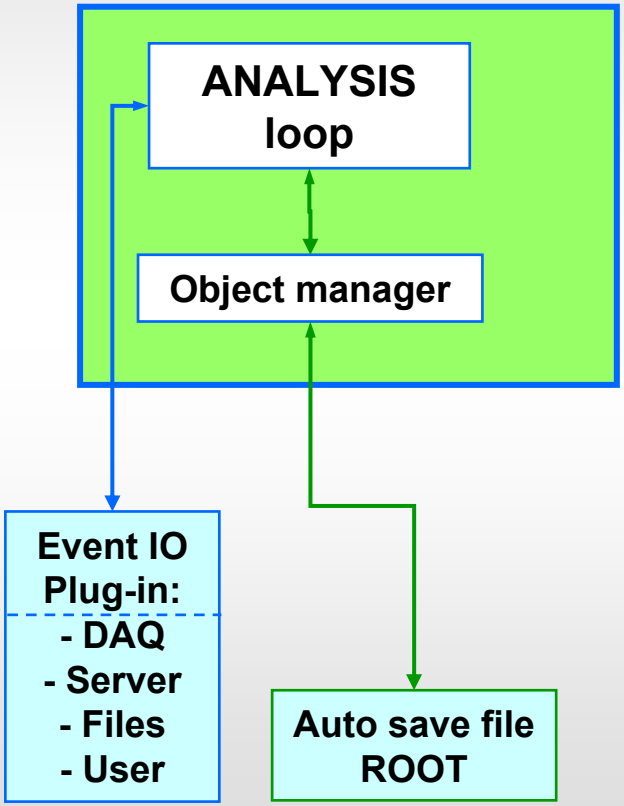
- Histograms
- Conditions
  - window condition: check 1 (2) value(s) against 2 limits (pairs of limits)
  - polygon condition: check if point (x,y) is inside/outside polygon
  - indexable arrays of conditions
  - allows for analysis flow control
  - statistics (true/false counters)
  - interactive control (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.

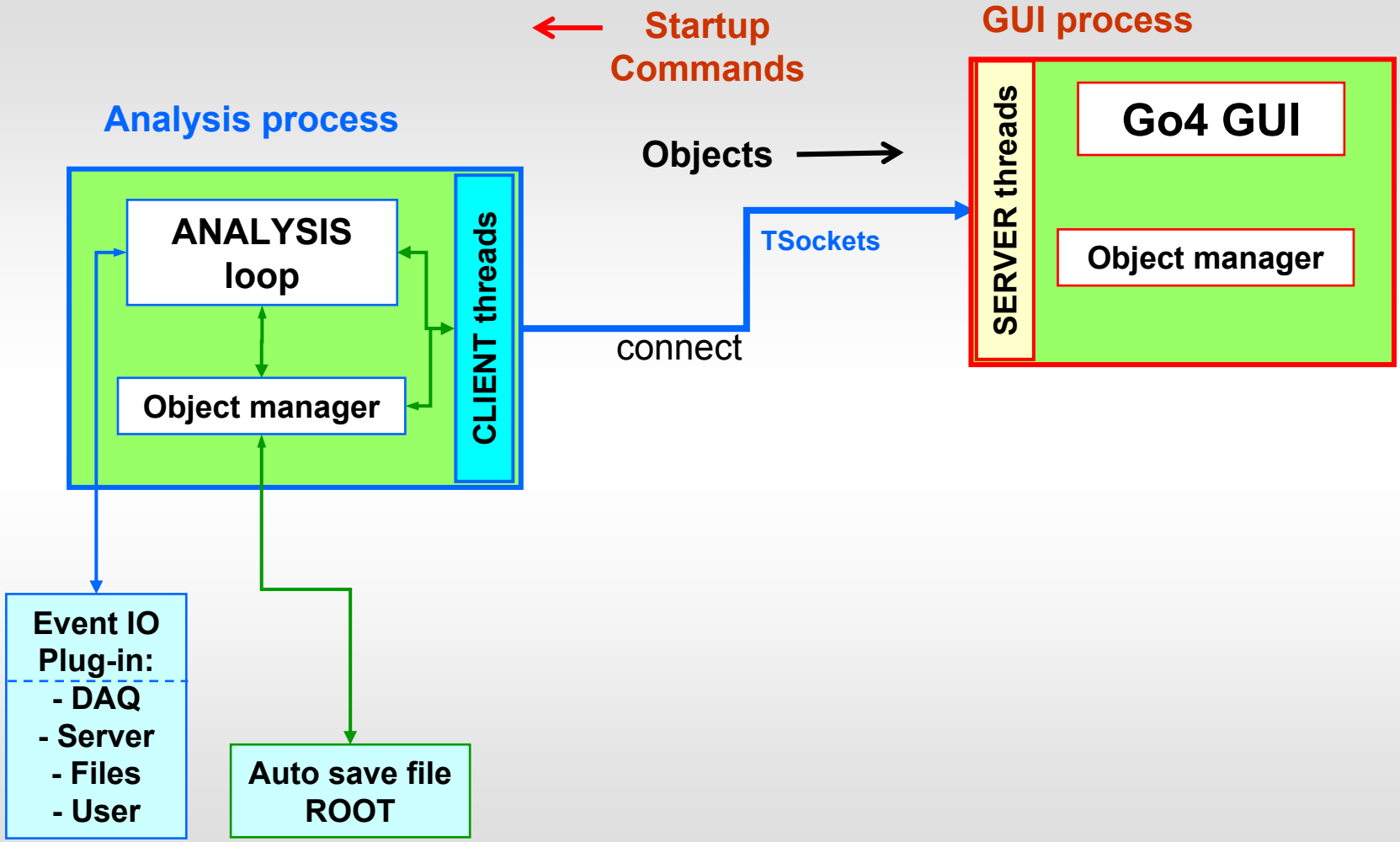
Go4 analysis: batch mode

Set up in code or macros

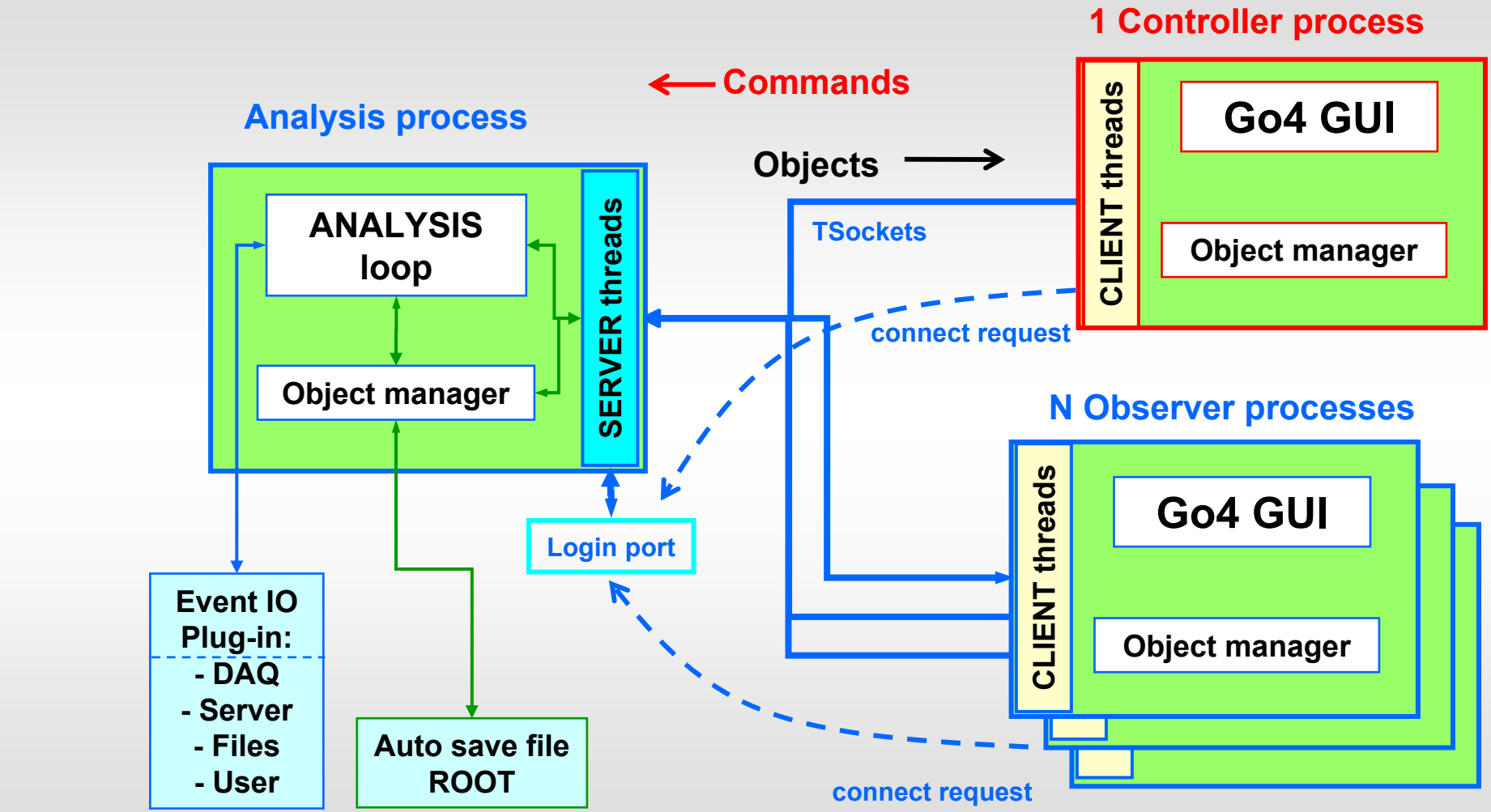
Analysis process



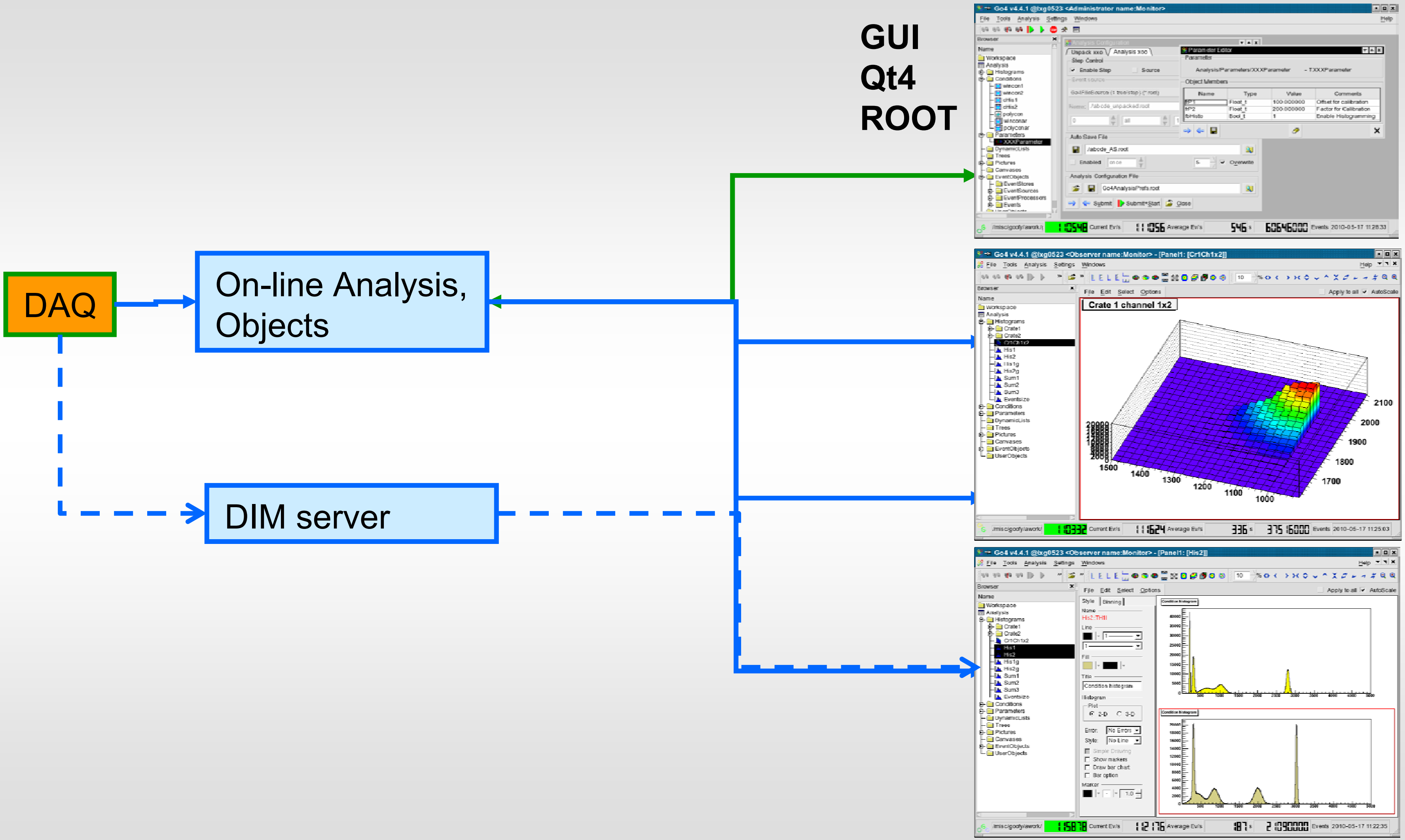
Go4 analysis: interactive mode



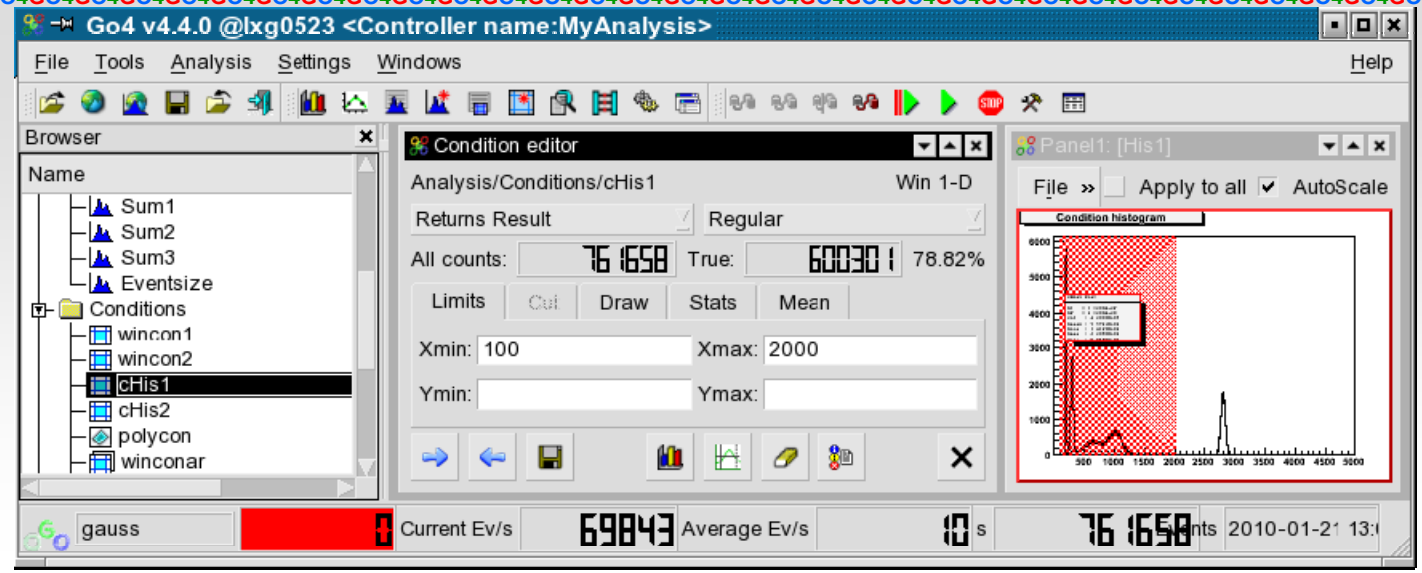
Go4 analysis: server mode

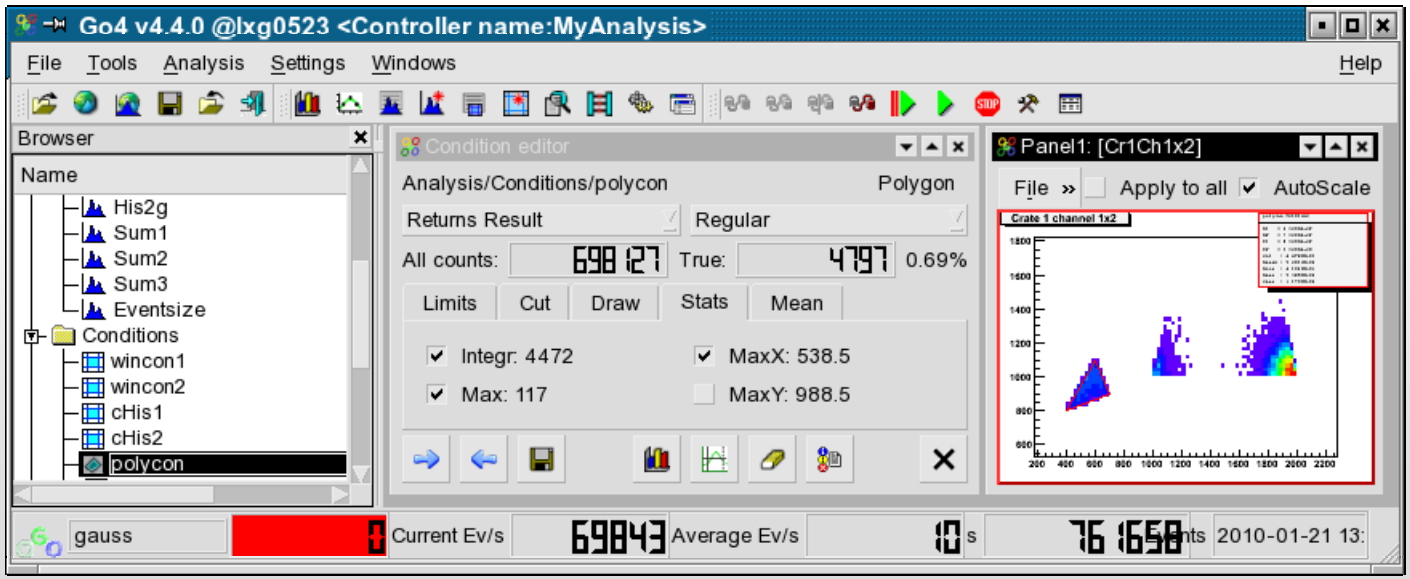


Go4 GUI, controller and observers



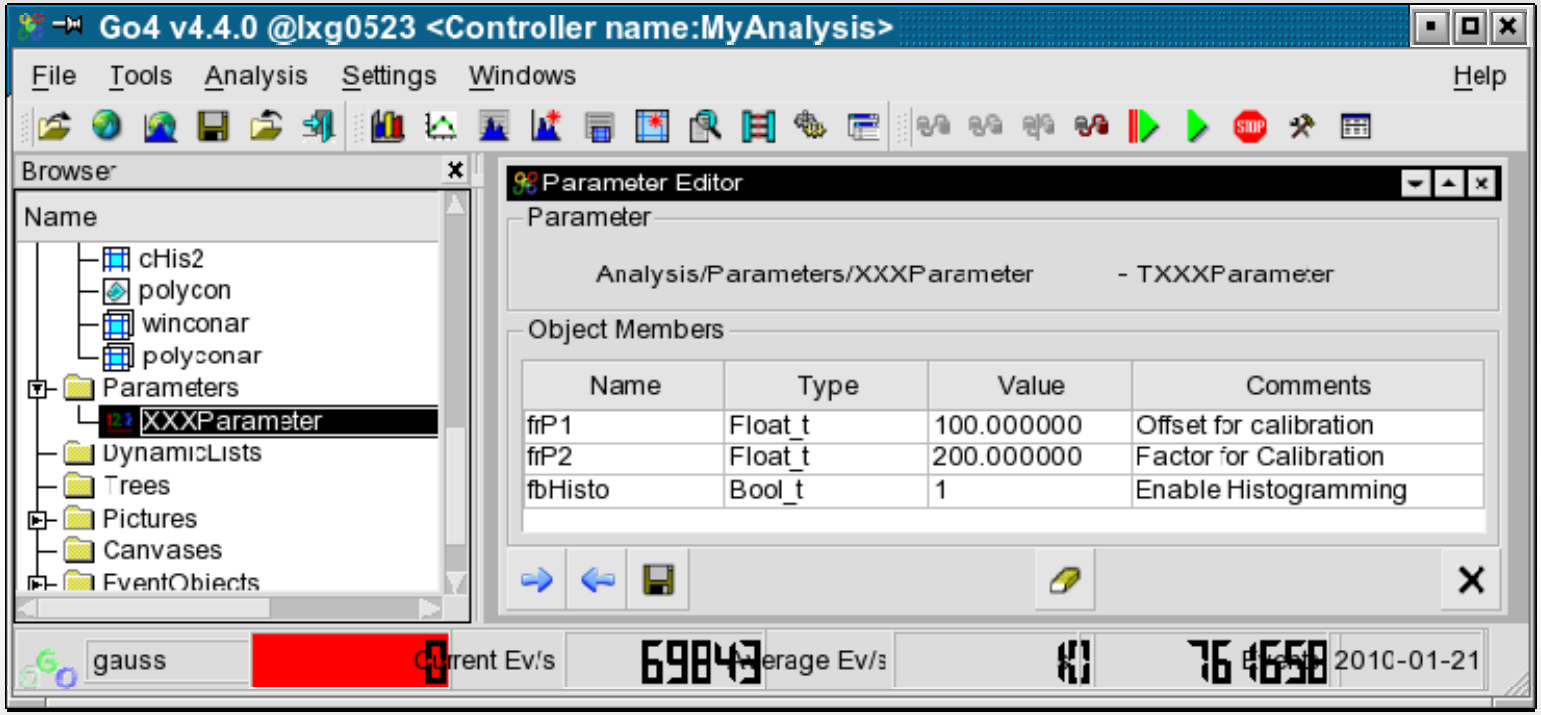
Go4 GUI: Condition editor



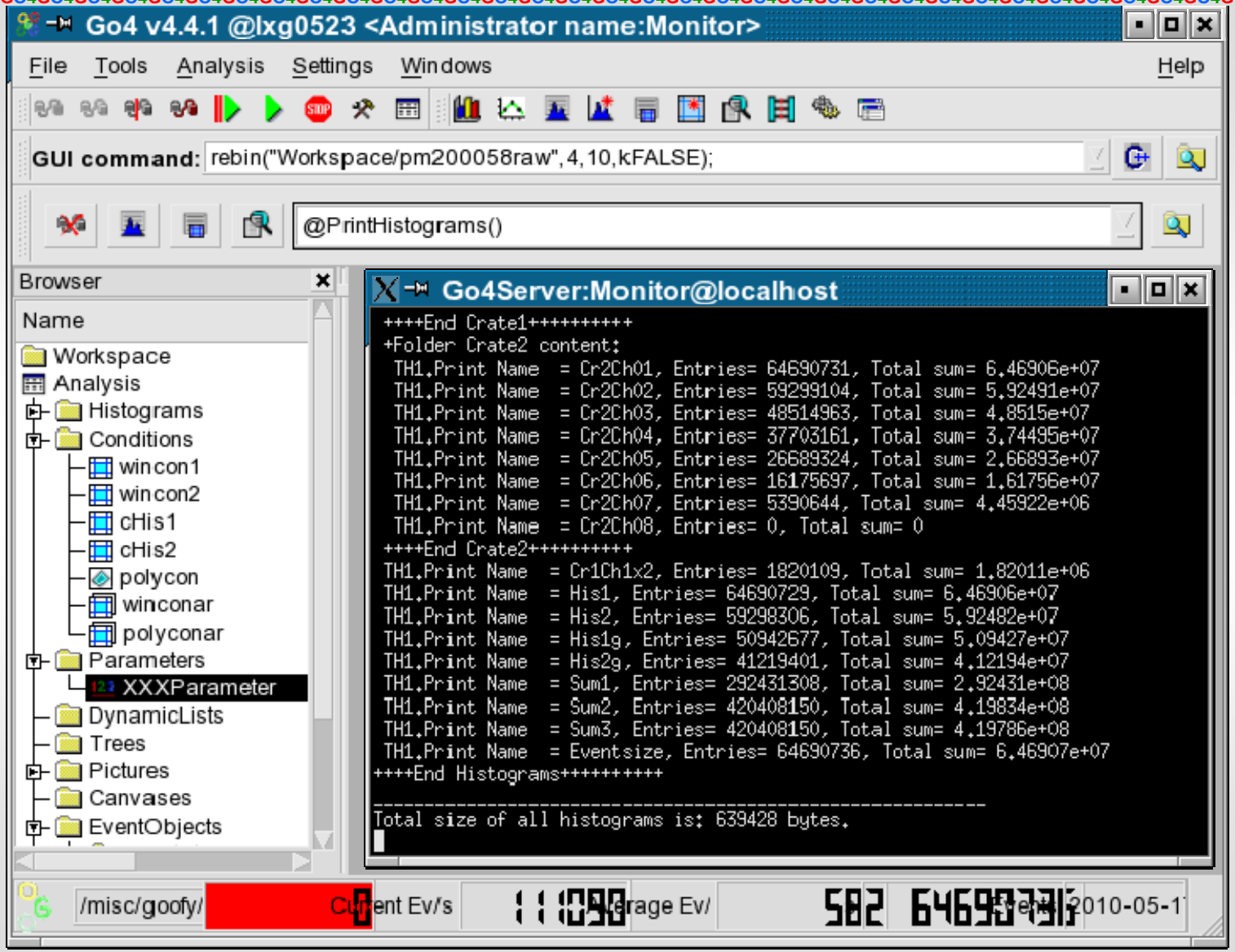


Go4 GUI: Parameter editor

Remote editing of object (data structure) contents



Go4 GUI: Local and remote Macro execution



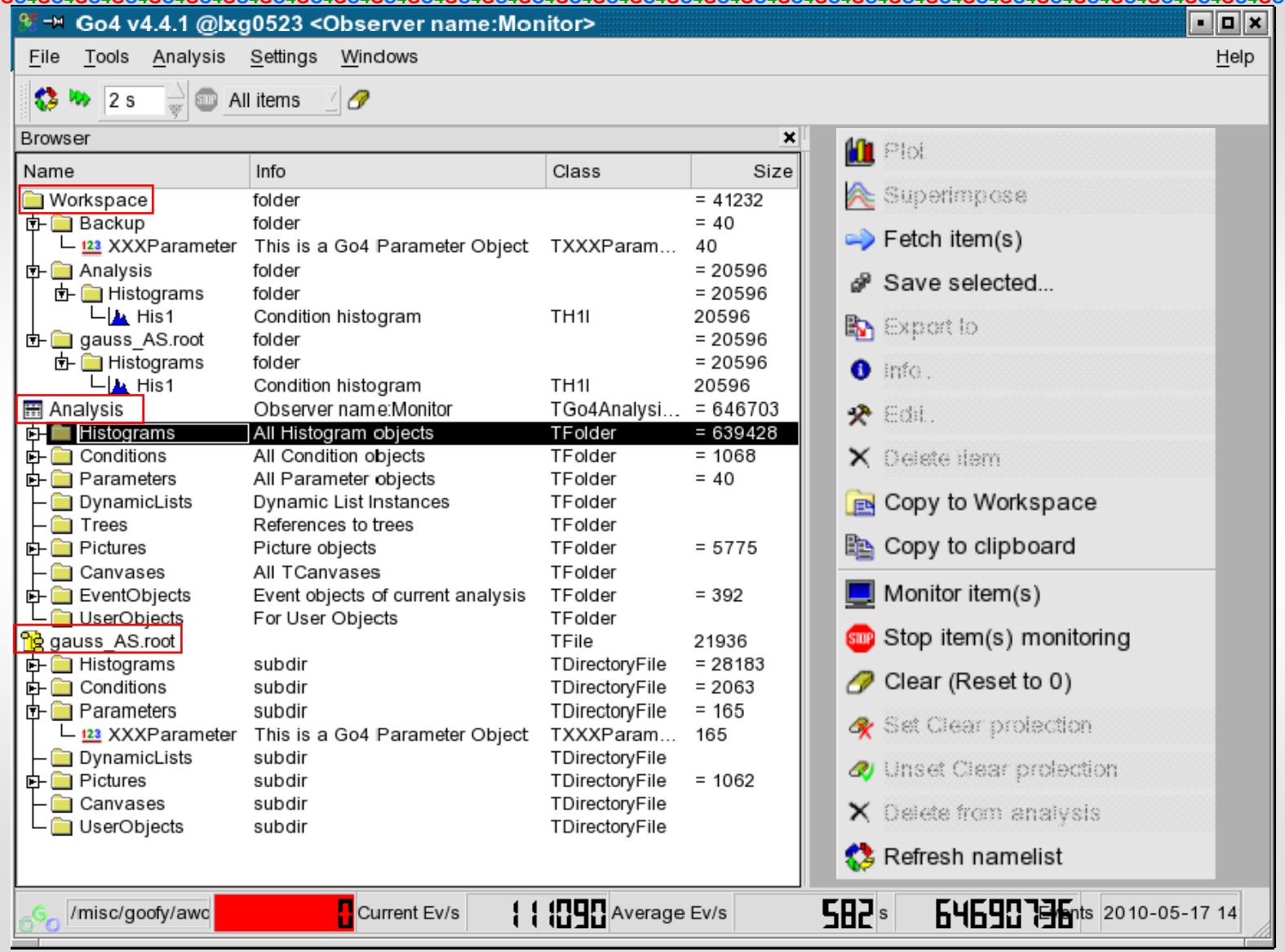
Go4 GUI: Monitoring

Update & Monitor

Local

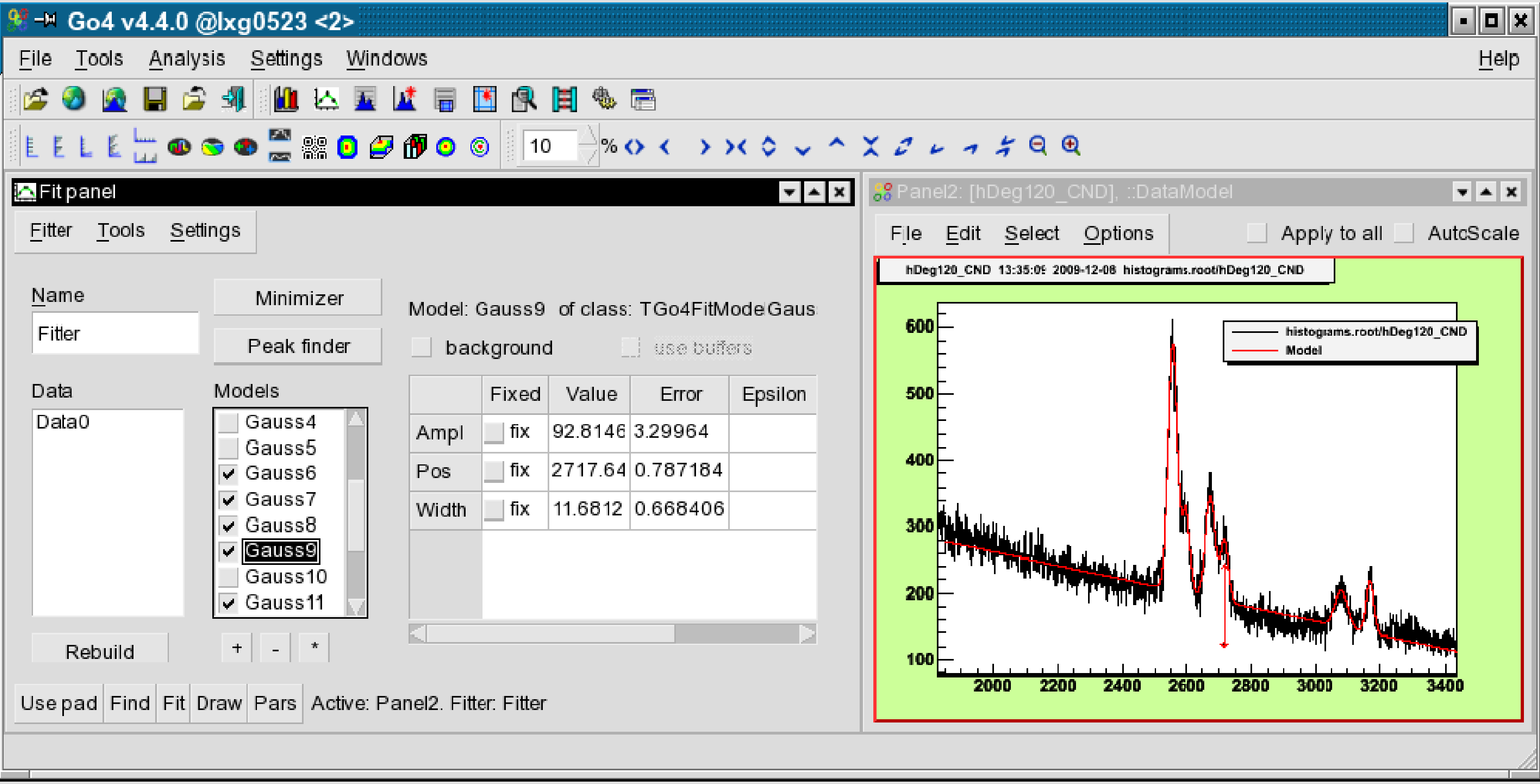
Remote

File



Go4 GUI: Fit panel

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