Go4 version 4.4

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Go4 Browser

- Browser functionality
- Usage as ROOT files browser
- Displaying data in view panel
- Objects in GUI workspace
- Export data from browser

Browser functionality

- One browser for all data sources
  (analysis, file, histogram server, memory,...)
- Full control by context menu
- Different objects properties displayed in columns
- Objects monitoring tool
- Objects filter tool by state (monitored, fetched, all)
- Local memory workspace with user subdirectories
- Support of drag-&-drop of items

ROOT files browser

- Go4 GUI can be used in offline as ROOT files browser
- To create example ROOT file:

```
shell$ cp $ROOTSYS/tutorials/hsimple.C .
shell$ root -l hsimple.C –q
```

- Open file with go4:

```
shell$ go4 hsimple.root
```

- Subdirectories and TTree brunches/leafs can be seen
- Display of any histogram by double click

Tree viewer

- Tree viewer activated by double-click on any tree leaf item
- 1-D, 2-D and 3-D tree draw is possible with cut condition
- Drag & drop of leafs names to viewer fields
- Automatic histogram creation or via special dialog

- Same in ROOT session:

```
shell$ root –l hsimple.root
root [1] new TBrowser;
root [2] “double click” leaf item in TBrowser
```

Browser columns and menus

- Browser displays up to 7 columns:

  Name – item name

  Flags – item status (monitored, fetched)

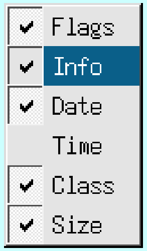
  Info – object title

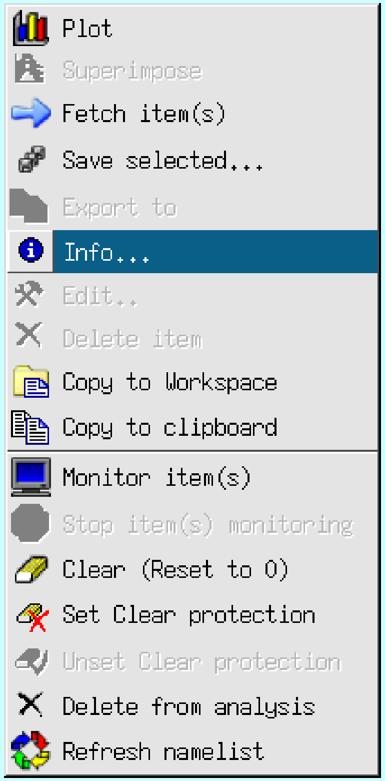
  Date, Time – when object is fetched

  Class – object class

  Size – object size or sum for folders

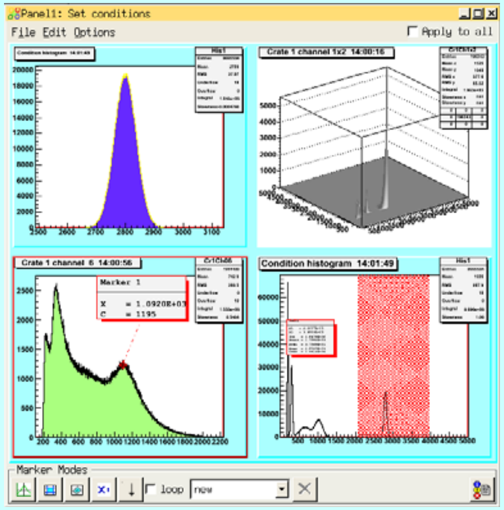
- To activate/deactivate columns, use right-mouse menu out of the **Name** column
- For each element context menu via right-mouse click on item name is available





Display of data in view panel

- Display by double click or via Draw in context menu
- Start empty view panel and drag & drop from browser
- View panel features:
  - subpads division
  - superimpose mode
  - different draw / log scale options
  - zooming tools
  - ROOT editor
  - markers editor (described later)
  - save as picture / canvas / image
  - date / time / name info in pads
- Superimpose via context menu in browser
- Usage of “Apply to all” flag
- “Fetch when drawing” flag from setting menu



Browser workspace

- Place for fixed (non-updated) objects copy
- Any ROOT-generated objects (like projections) will (should) appear in workspace
- For most objects in browser “Copy to workspace” context menu can be activated
- Copy & paste functionality for any object / folder
- Subfolders can be created / renamed / deleted
- Store of Workspace folders in ROOT file
- “Fetch when copying” flag from setting menu

Export of browser content

- Complete content can be store in ROOT file via “Save memory” menu command
- ROOT binary and XML format are supported
- Any selected item(s) can be stored in ROOT file
- “Fetch when saving” flag from setting menu
- Export of histograms content to ASCII (Excel, Origin) and Radware

Go4 GUI elements

- Condition editor
- Marker editor
- Parameter editor
- Dynamic list editor

Preparation

- For demonstration example $GO4SYS/Go4ExampleAdvanced will be used
- To run example:

```
shell$ . go4login
shell$ cd $GO4SYS/Go4ExampleAdvanced
shell$ go4
go4$ “Launch analysis”
go4$ Configure without Autosave
go4$ Submit & start analysis
```

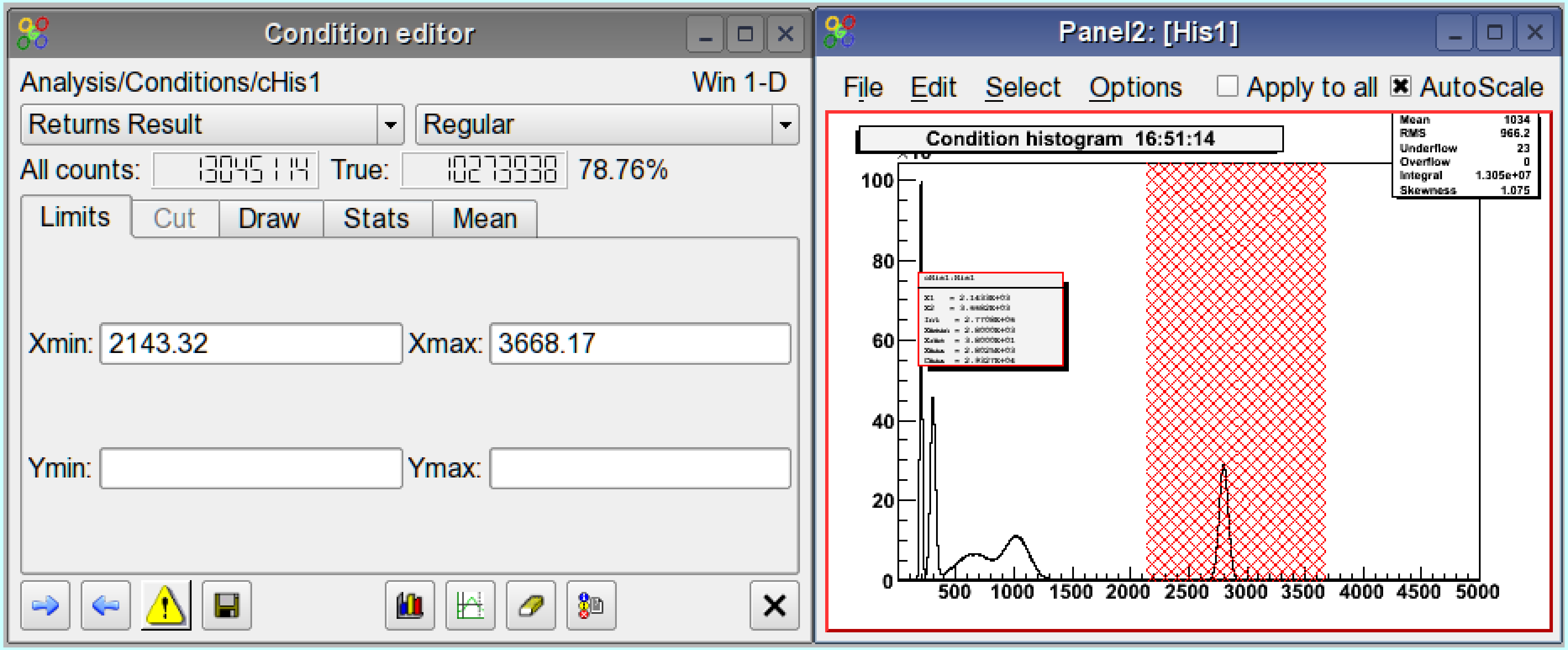
Condition classes

- TGo4Condition – base class for any condition
- TGo4WindCond – 1-D or 2-D window condition
- TGo4PolyCond – 2-D polygon condition
- TGo4CondArray – array of conditions

- To be used in analysis for testing event data against boundary condition, activating/deactivating analysis code

- Main methods:
  - Test(x), Test(x,y) – check if tested value(s) comply with the condition
  - SetHistogram(name) – connect condition with histogram for displaying

Condition editor



Analysis/Conditions/cHis1 Win 1-D

Returns Result ▾ Regular ▾

All counts: 13045114 True: 10273938 78.76%

Xmin: 2143.32 Xmax: 3668.17

Ymin: Ymax:

☐ Apply to all ☒ AutoScale

Condition histogram 16:51:14

```
Mean         1034
RMS         966.2
Underflow      23
Overflow        0
Integral 1.305e+07
Skewness    1.075
```

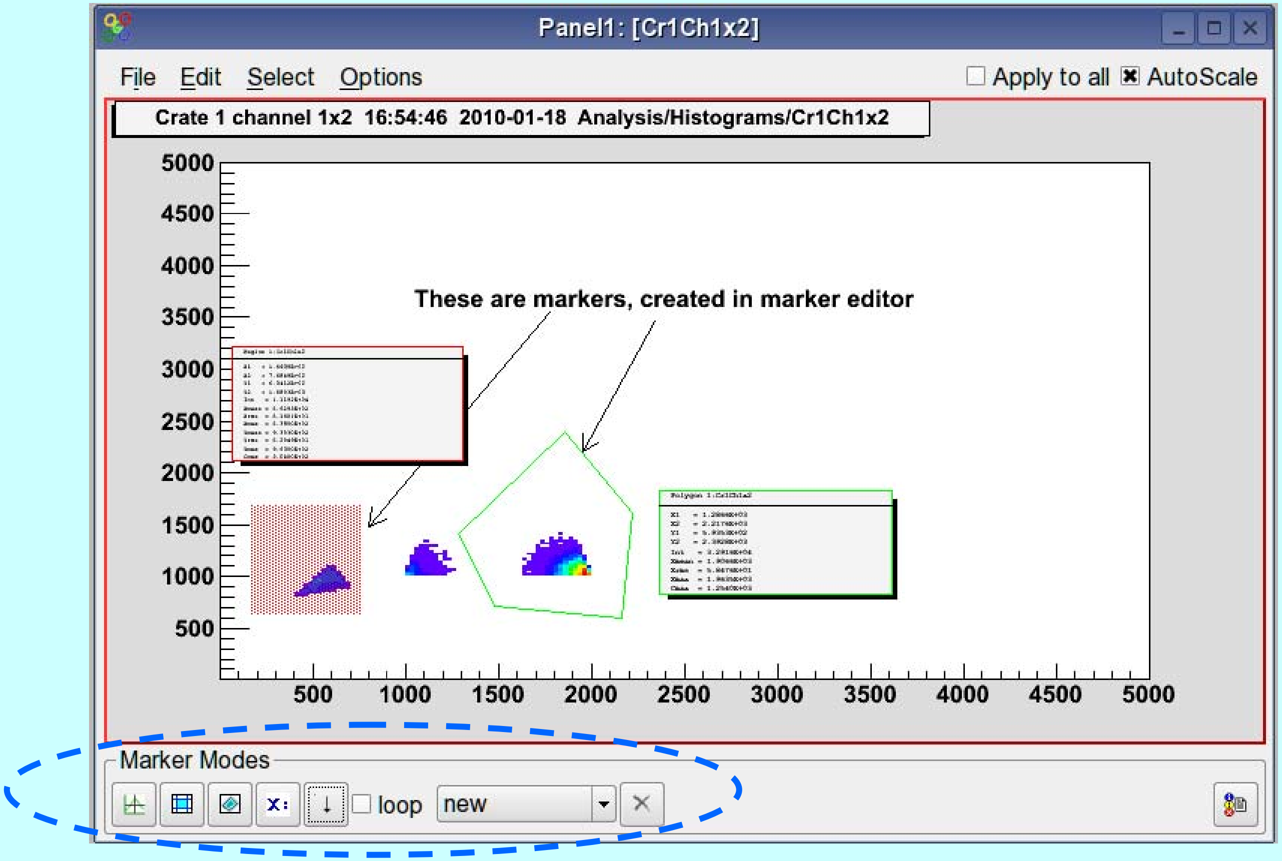
```
cHis1:His1
X1    = 2.1433E+03
X2    = 3.6682E+03
Int    = 2.7706E+06
Xmean  = 2.8000E+03
Xrms   = 1.8000E+01
Xmax   = 2.8027E+03
Cmax   = 2.9327E+04
```

Working with condition editor

- Activation: double click on condition, condition context menu, drag & drop condition to editor
- Displaying condition on view panel with draw button or drag & drop to viewpanel
- Changing condition values in editor or in view panel
- Update condition in analysis, store / restore condition in file
- Creating new condition in analysis

Marker editor

- Add-on for view panel functionality



Crate 1 channel 1x2 16:54:46 2010-01-18 Analysis/Histograms/Cr1Ch1x2

These are markers, created in marker editor

```
Region 1:Cr1Ch1x2
X1     = [illegible]
X2     = [illegible]
Y1     = [illegible]
Y2     = [illegible]
Int    = [illegible]
Xmean  = [illegible]
Xrms   = [illegible]
Xmax   = [illegible]
Ymean  = [illegible]
Yrms   = [illegible]
Ymax   = [illegible]
Cmax   = [illegible]
```

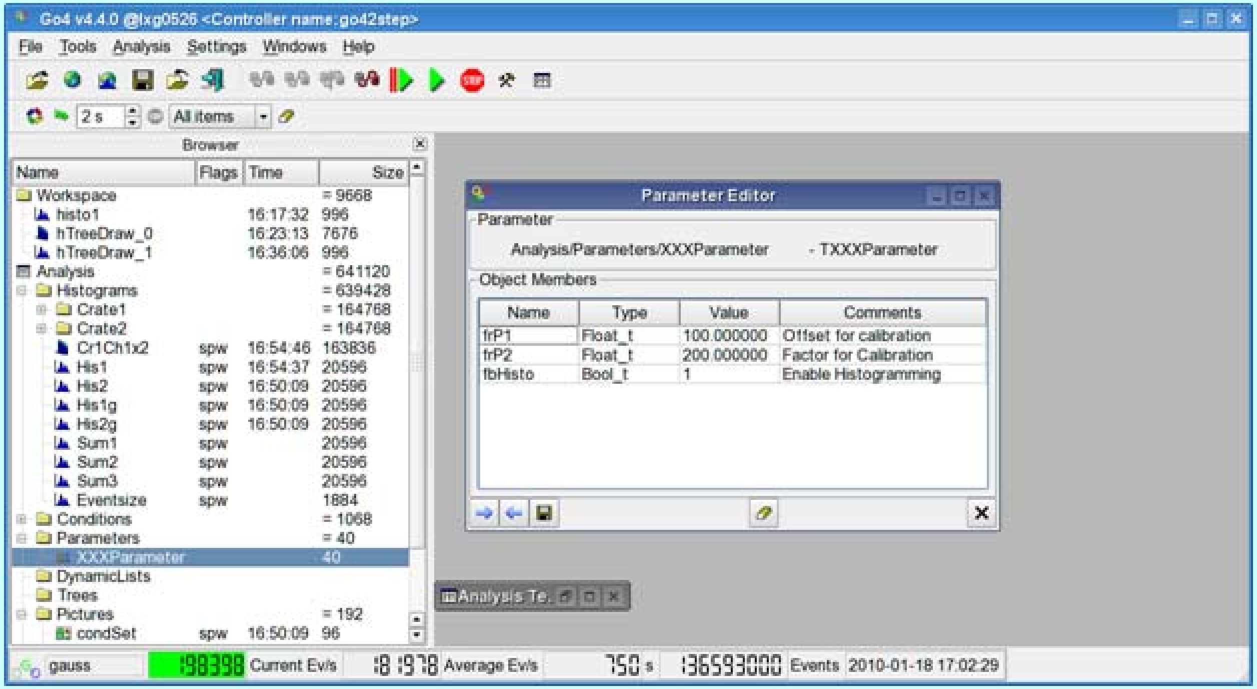
```
Polygon 1:Cr1Ch1x2
X1     = [illegible]
X2     = 2.2178E+03
Y1     = [illegible]
Y2     = [illegible]
Int    = [illegible]
Xmean  = [illegible]
Xrms   = [illegible]
Xmax   = [illegible]
Cmax   = [illegible]
```

Marker editor

- User can add following objects:
  - 1-D, 2-D or polygon marker
  - Text label
  - Arrow
- Loop mode to add many objects in once
- Select / change / delete specific markers
- Can be used as reduced condition editor

Parameter editor

- Editing of local/remote TGo4Parameter objects



Name	Flags	Time	Size
Workspace			= 9668
histo1		16:17:32	996
hTreeDraw_0		16:23:13	7676
hTreeDraw_1		16:36:06	996
Analysis			= 641120
Histograms			= 639428
Crate1			= 164768
Crate2			= 164768
Cr1Ch1x2	spw	16:54:46	163836
His1	spw	16:54:37	20596
His2	spw	16:50:09	20596
His1g	spw	16:50:09	20596
His2g	spw	16:50:09	20596
Sum1	spw		20596
Sum2	spw		20596
Sum3	spw		20596
Eventsize	spw		1884
Conditions			= 1068
Parameters			= 40
XXXParameter			40
DynamicLists			
Trees			
Pictures			= 192
condSet	spw	16:50:09	96

Parameter

Analysis/Parameters/XXXParameter - TXXXParameter

Object Members

Name	Type	Value	Comments
frP1	Float_t	100.000000	Offset for calibration
frP2	Float_t	200.000000	Factor for Calibration
fbHisto	Bool_t	1	Enable Histogramming

gauss 198398 Current Ev/s 181978 Average Ev/s 750 s 136593000 Events 2010-01-18 17:02:29

User parameter class

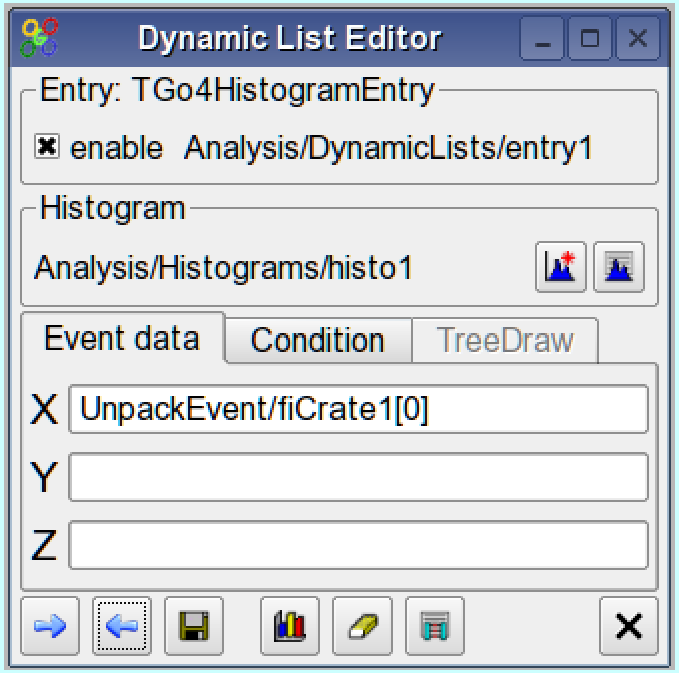
- User classes, derived from TGo4Parameter, could be used as coefficients table
- TGo4Parameter::UpdateFrom() method can be implemented for user control how values will be assigned in the analysis
- For simple cases UpdateFrom() implementation is no longer required

Parameter editor

- Basic data types, array of basic data types, TString and TGo4Fitter are supported for editing
- Array contents can be expanded / shrinked
- Comments in class declaration are visible in parameter editor
- Class library **is not required** for parameter editing (only for file I/O)
- Parameter can be updated in analysis or stored / restored in file

Dynamic list editor

- For fast histogramming without code changing



Entry: TGo4HistogramEntry

☒ enable Analysis/DynamicLists/entry1

Histogram

Analysis/Histograms/histo1

X UnpackEvent/fiCrate1[0]

Y

Z

Dynamic list editor

- Browser displays analysis event structure and opened tree in analysis
- These data updated once per event and therefore can be used for histogramming
- Two alternatives for dynamic histogramming:
  - over any element(s) in events structures, including condition
  - TTree::Draw() operation