

# What's new in JANA 0.7.3

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# ... from CHANGES file ...

## Changes in version 0.7.3

- - Fixed issue with EVENTS\_TO\_SKIP only skipping EVENTS\_TO\_SKIP-1 events
- - Add janaview plugin
- - Add support for stdint types like uint32\_t in janaroot
- - Fixed longstanding bug in jgeomread where attributes specified in the middle of the xpath were not displayed
- - Made JANA\_CALIB\_URL and JANA\_CALIB\_CONTEXT config. parameters
- - Make JObject::Get() search for associated objects of associated objects,...
- (added associated\_objects unit test to check that it works)
- - Added JObject::GetAssociatedDescendants()
- - Added JCalibration::GetVariation()
- - Add EVENT\_SOURCE\_TYPE param. to allow user to force source type
- - Add --listconfig command line switch
- - -PAUTOACTIVATE=all activates all factories automatically
- - Add vector versions of GetCalib to JCalibration API to allow access to calibration constants while maintaining position order of source
- - Add RUNNUMBER configuration parameter that can be used to override the event source supplied run number.
- - Added event barrier mechanism (set JEvent::sequential flag in JEventSource)
- - Made event number uint64\_t in most places and run number int32\_t

# janaview plugin

- Graphical “hd\_dump”
- Plugin builds with JANA, but can be used with implementation programs

*> hd\_ana -PPLUGINS=janaview file.evio*

- Click on objects to navigate. Factory activated when clicked on (or if next event visited and object was already selected)

File Tools View

Current Event Info

Source: hd\_rawdata\_003180\_000.evio

Run: 3180

Event: 3

Next

Object Types

- DCAEN1290TDCCConfig
- DCAEN1290TDCHit
- DCCALGeometry
- DCCALHit
- DCCALHit:TRUTH
- DCCALTruthShower
- DCDCDigiHit
- DCDCHit
- DCDCHit:TRUTH
- DCDCTrackHit**
- DCODAEventInfo
- DCODAROCInfo
- DCereHit
- DChargedTrack
- DChargedTrack:PreSelect
- DChargedTrackHypothesis
- DChargedTrackHypothesis:Combo
- DChargedTrackHypothesis:KinFit
- DDetectorMatches
- DDetectorMatches:Combo
- DDetectorMatches:WireBased
- DEPICSvalue
- DEventRFBunch
- DEventRFBunch:Calibrations
- DEventRFBunch:Combo
- DEventRFBunch:Thrown
- DEventWriterREST
- DEventWriterROOT
- DF1TDCCConfig
- DF1TDCHit
- DF1TDCTriggerTime
- DFCALCluster
- DFCALDigiHit
- DFCALGeometry

Object Details | Call Graph

DCDCTrackHit

Objects this event

- 0x00007f938c8a0160 DCDCTrackHit**
- 0x00007f938c89fed0 DCDCTrackHit
- 0x00007f938c899120 DCDCTrackHit
- 0x00007f938c8a0940 DCDCTrackHit
- 0x00007f938c8a09c0 DCDCTrackHit
- 0x00007f938c898640 DCDCTrackHit
- 0x00007f938c8986c0 DCDCTrackHit
- 0x00007f938c898740 DCDCTrackHit
- 0x00007f938c8a0a90 DCDCTrackHit
- 0x00007f938c8a0b90 DCDCTrackHit
- 0x00007f938c8a0c10 DCDCTrackHit
- 0x00007f938c8a0c90 DCDCTrackHit
- 0x00007f938c8a0d10 DCDCTrackHit
- 0x00007f938c8a0d90 DCDCTrackHit
- 0x00007f938c8a0e10 DCDCTrackHit
- 0x00007f938c8a0e90 DCDCTrackHit
- 0x00007f938c8a0f10 DCDCTrackHit
- 0x00007f938c8a0b10 DCDCTrackHit
- 0x00007f938c8a1090 DCDCTrackHit
- 0x00007f938c8a1110 DCDCTrackHit
- 0x00007f938c8a1190 DCDCTrackHit
- 0x00007f938c8a1210 DCDCTrackHit
- 0x00007f938c8a1290 DCDCTrackHit
- 0x00007f938c8a1310 DCDCTrackHit
- 0x00007f938c8a1390 DCDCTrackHit

Associated Objects

- 0x00007f938c8944e0 DCDCHit

Objects to which this is associated  
(may be incomplete)

- 0x00007f93907c3470 DTrackCandidate
- 0x00007f938cc15490 DTrackCandidate**
- 0x00007f938cc15490 DTrackCandidate

0x00007f938cc15490 : DTrackCandidate

PID : 0  
 Name : Unknown  
 q : +1  
 x (cm) : -5.6  
 y (cm) : -7.7  
 z (cm) : 60.0  
 E (GeV) : 0.4786  
 t (ns) : 0.000  
 p (GeV/c) : 0.479  
 theta (deg) : 55.745  
 phi (deg) : -128.999  
 id : 0x8cc15490  
 chisq : 8.176061  
 N dof : 11

# Call-graph feature not really working great, but provides some functionality....

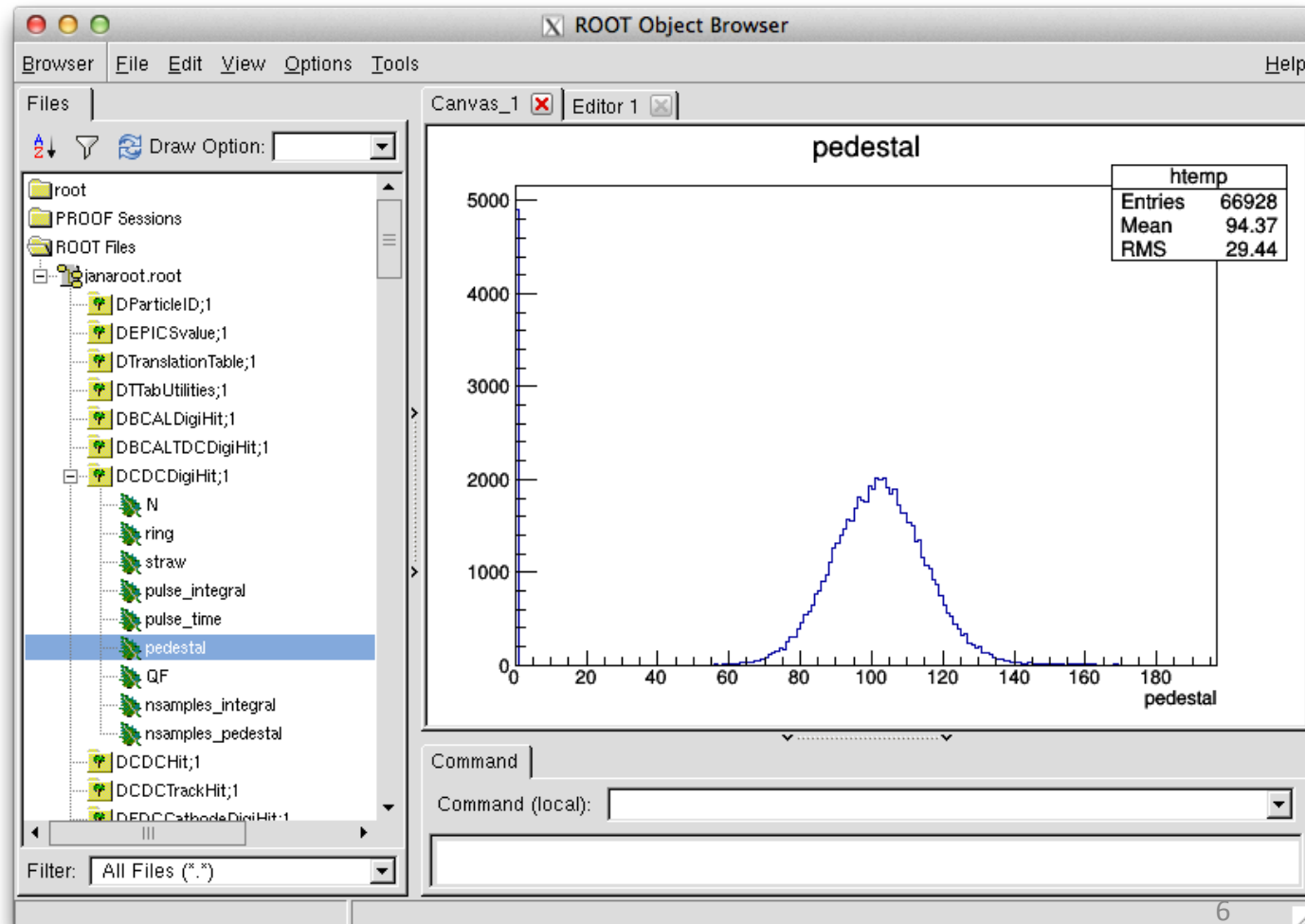
The screenshot shows the JANA Viewer interface. At the top, the title bar reads "JANA Viewer". Below it is a menu bar with "File", "Tools", and "View". The "Current Event Info" panel displays "Source: hd\_rawdata\_003180\_000.evio", "Run: 3180", and "Event: 5", with a "Next" button. The "Object Types" list on the left includes various detector and analysis classes such as DTrackCandidate, DTrackFinder, DTrackFitter, DTrackHitSelector, DTrackTimeBased, DTrackWireBased, DTranslationTable, DVertex, Df125Config, Df125PulseIntegral, Df125PulsePedestal, Df125PulseRawData, Df125PulseTime, Df125TriggerTime, Df125WindowRawData, Df250Config, Df250PulseIntegral, Df250PulsePedestal, Df250PulseRawData, and Df250PulseTime. The "Object Details" panel is set to "Call Graph" and shows a network of nodes representing objects and their interactions. The nodes are arranged in columns, with a dense cluster of nodes on the left and a few nodes on the right. The nodes on the right are DCDCHit, DCDCTrackHit, and JEventProcessor\_janaview, which are connected by a few lines. The nodes on the left include Df250PulseTime, Df250PulsePedestal, Df250PulseIntegral, Df250Config, Df125PulseTime, Df125PulsePedestal, Df125PulseIntegral, Df125Config, DF1TDCHit, DF1TDCCConfig, DCAEN1290TDCHit, DCAEN1290TDCCConfig, DTOFTDCDigiHit, DTOFDigiHit, DSCTDCDigiHit, DSCDigiHit, DRFTDCDigiTime, DRFDigiTime, DFDCWireDigiHit, DFDCCathodeDigiHit, DFCALDigiHit, DCDCDigiHit, and DBCALTDigiHit. The connections between nodes are represented by thin black lines, showing a complex web of dependencies and calls.

# Support stdint types in janaroot

*janaroot* is a plugin that comes with JANA and can be used to quickly make ROOT trees of any factory object

Some data objects are now defining variables as *uint32\_t* or similar types. These are now supported by *janaroot*

```
> hd_ana \  
-PPLUGINS=janaroot \  
-PAUTOACTIVATE=DTrackCandidate \  
hd_rawdata_003180_000.evio
```



# Fixed longstanding bug in *jgeomread* where attributes specified in the middle of the *xpath* were not displayed

- *jgeomread* utility can be used to extract numbers from the XML geometry definition
- The syntax used is based on *xpath* and is the same as is used in the HDGEOMETRY library

## Example: list all xpaths

```
> jgeomread -L
```

```
List of all valid xpaths for url="xmlfile:///Users/davidl/HallID/builds/hdds/main_HDDS.xml" (4718 total)
```

```
-----  
/HDDS[@specification='v1.1' and @xmlns='http://www.gluex.org/hdds' and @xmlns:xsi='http://www.w3.org/2001/XMLSchema-instance' and @xsi:schemaLocation='http://www.gluex.org/hdds HDDS-1_1.xsd']
```

```
/HDDS/Material_s
```

```
/HDDS/Material_s/materials[@author='R.T. Jones' and @date='2006-11-22' and @specification='v1.0' and @version='3.0']
```

```
/HDDS/Material_s/materials/element[@a='1.00797' and @name='Hydrogen' and @symbol='H' and @z='1']
```

```
/HDDS/Material_s/materials/element/real[@name='density' and @unit='g/cm^3' and @value='0.0000838']
```

```
/HDDS/Material_s/materials/element/real[@name='radlen' and @unit='g/cm^2' and @value='61.28']
```

```
/HDDS/Material_s/materials/element/real[@name='collen' and @unit='g/cm^2' and @value='43.3']
```

```
/HDDS/Material_s/materials/element/real[@name='abslen' and @unit='g/cm^2' and @value='50.8']
```

```
/HDDS/Material_s/materials/element/real[@name='dedx' and @unit='MeV/g/cm^2' and @value='4.045']
```

```
/HDDS/Material_s/materials/element[@a='1.00797' and @name='LiqHydrogen' and @symbol='LH' and @z='1']
```

```
/HDDS/Material_s/materials/element/real[@name='density' and @unit='g/cm^3' and @value='0.0708']
```

```
/HDDS/Material_s/materials/element/real[@name='radlen' and @unit='g/cm^2' and @value='61.28']
```

```
/HDDS/Material_s/materials/element/real[@name='collen' and @unit='g/cm^2' and @value='43.3']
```

```
...
```

# JObject:Get() does recursive searches for associated objects

- Example:

```
vector<const Df125Config*> configs;
```

```
cdchit->Get(configs);  all levels of association are searched
```

- Optional 3<sup>rd</sup> argument allows one to specify maximum depth to search:

```
cdchit->Get(configs, "", 1);  only direct associations are searched
```

- Each object encountered will be returned only once and cyclic associations are properly handled



# Event Barriers

- Classes inheriting from *JEventSource* may treat certain events as special:
  - Wait for all threads to complete processing of all events already read in
  - Send through the barrier event alone
  - Resume full multi-threaded processing
- This is intended for things like EPICS events where global variables may be used to hold the latest value encountered

# Added --listconfig switch

- >hd\_ana --listconfig

```
...
ANALYSIS:DEBUGLEVEL = 0          #
      AUTOACTIVATE = all        #
      BCAL:PHI_CUT_PAR1 = 0.0175 #
      BCAL:PHI_CUT_PAR2 = 0.00176 #
      BCAL:Z_CUT = 10          #
BCALHIT:PRINTCALIBRATION = 0     # Print the calibration parameters.
BCALPOINT:PRINTCALIBRATION = 0   # Print the calibration parameters.
BCALRECON:BREAK_THRESH_TRMS = 5   #
      BCALRECON:CLUST_THRESH = 0.0299999993294477 #
BCALRECON:MERGE_THRESH_DIST = 40  #
BCALRECON:MERGE_THRESH_TIME = 2.5 #
BCALRECON:MERGE_THRESH_XYDIST = 40 #
BCALRECON:MERGE_THRESH_ZDIST = 30 #
      BCALUNIFIEDHIT:VERBOSE = 0  # Set level of verbosity.
```

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