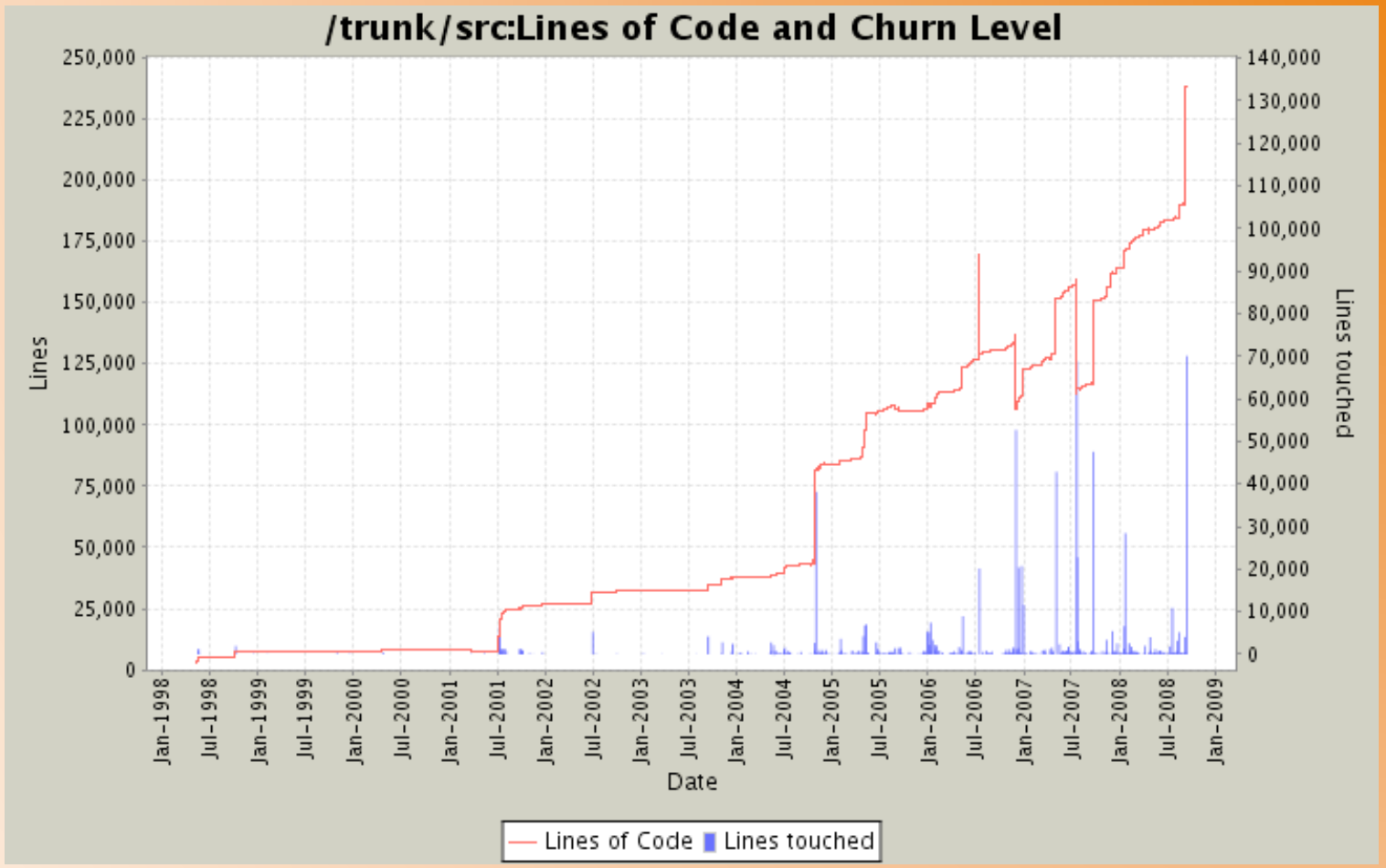
GlueX Software Status + Framework Development

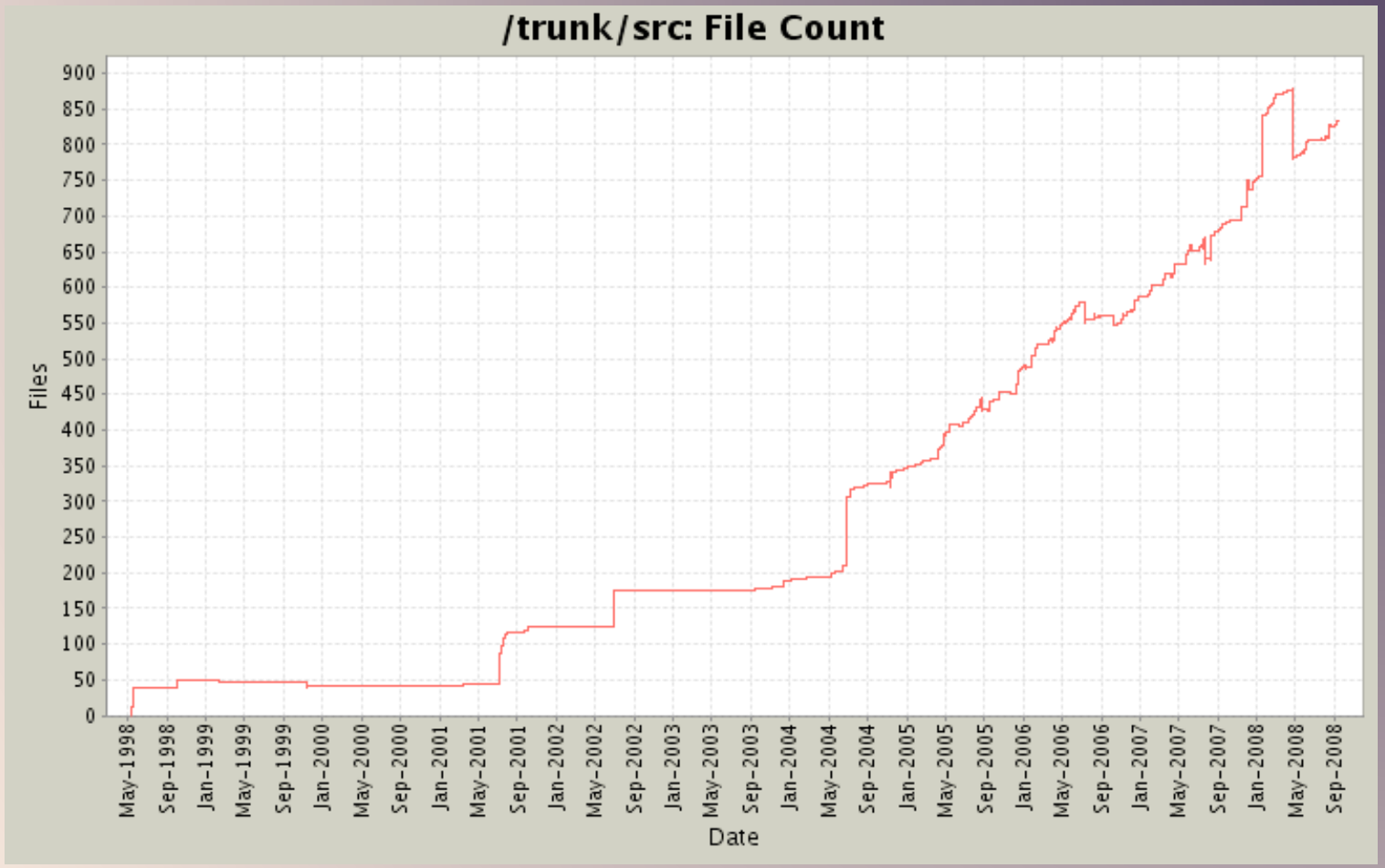
David Lawrence JLab

September 19, 2008

Lines of code in repository

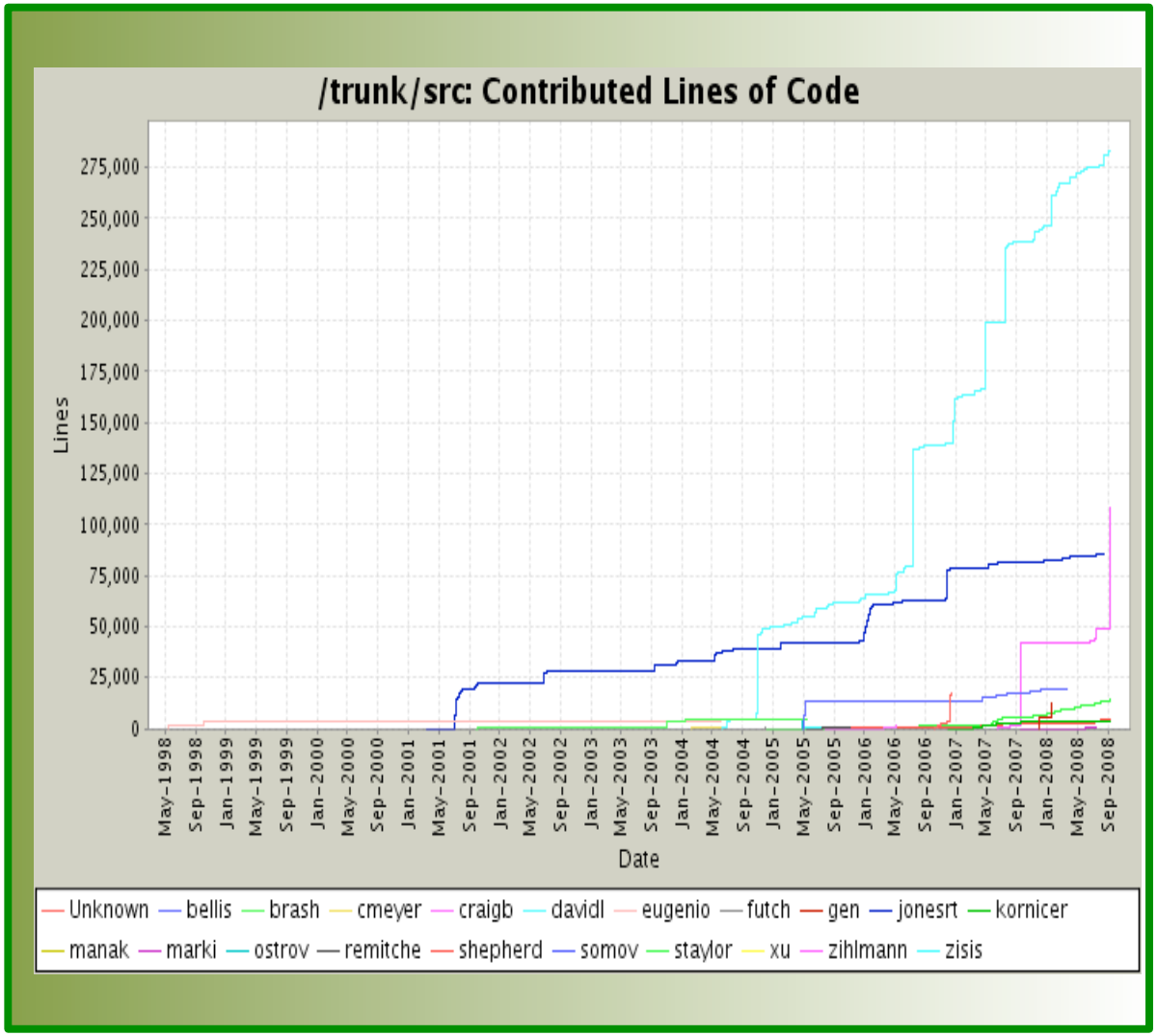


Number of files in Repository



Individual User Contributions to Repository

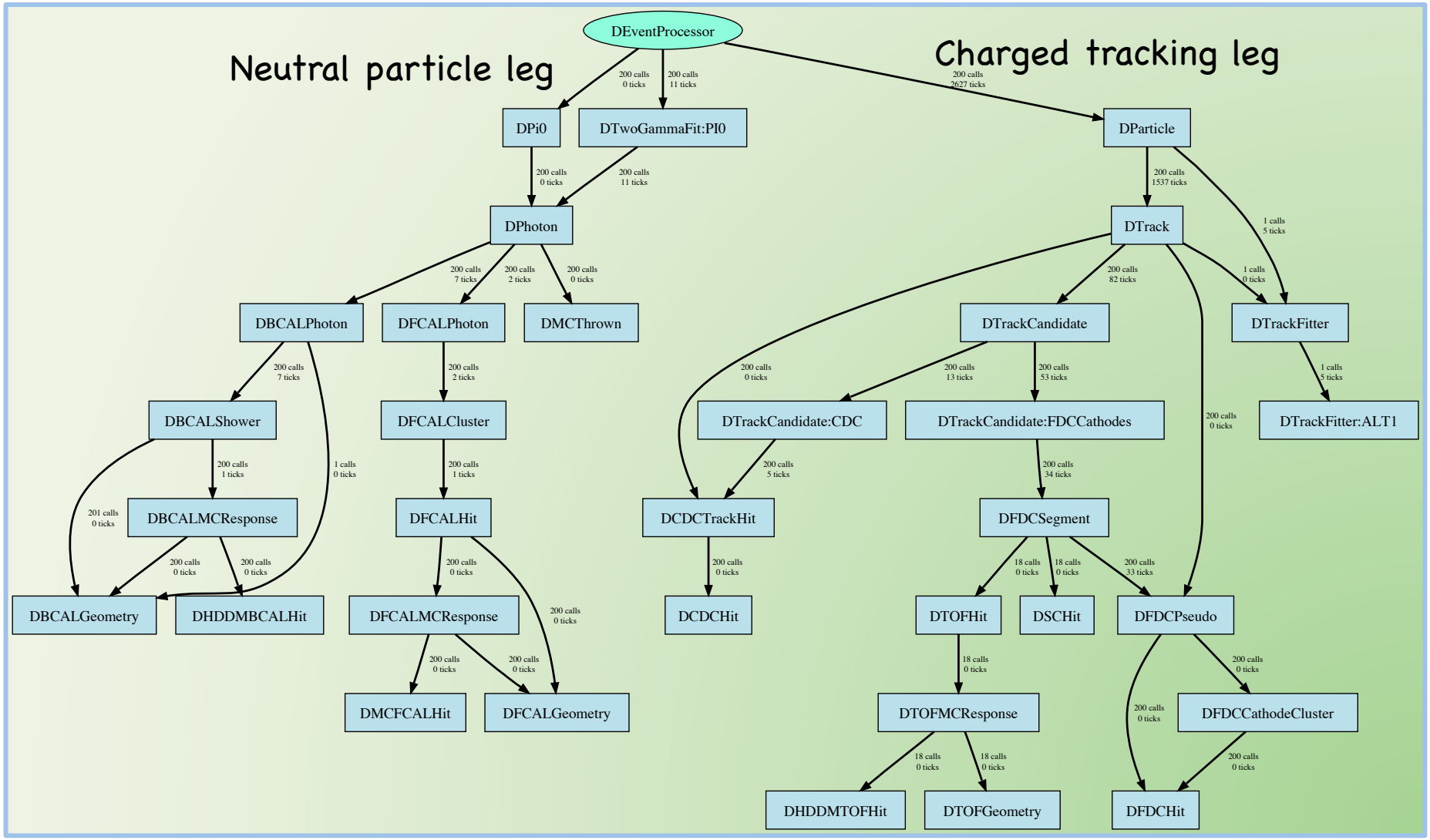
(only includes *src* tree)



Developer of the Month

Month	Author	Lines
September 2008	zihlmann	59062
August 2008	davidl	5288
July 2008	zihlmann	6361
June 2008	davidl	1255
May 2008	davidl	1567
April 2008	davidl	4625
March 2008	jonesrt	834
February 2008	davidl	6008
January 2008	davidl	14861
December 2007	gen	5399
November 2007	davidl	4747
October 2007	bellis	749
September 2007	zihlmann	40905
August 2007	davidl	1607
July 2007	davidl	37208
June 2007	staylor	1551
May 2007	davidl	32601
April 2007	bellis	1968
March 2007	davidl	1904
February 2007	davidl	424
January 2007	davidl	1528
December 2006	davidl	22441
November 2006	jonesrt	15280
October 2006	Unknown	1593
September 2006	davidl	11

Reconstruction software continues to GROW!

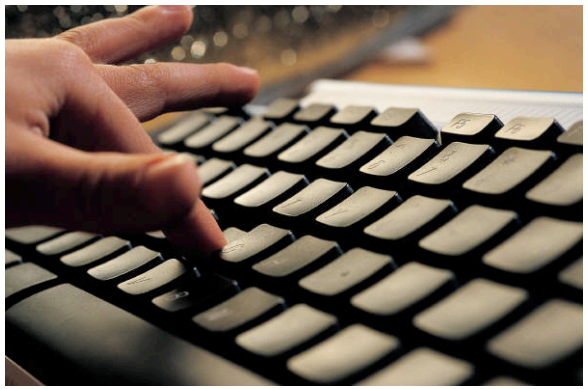


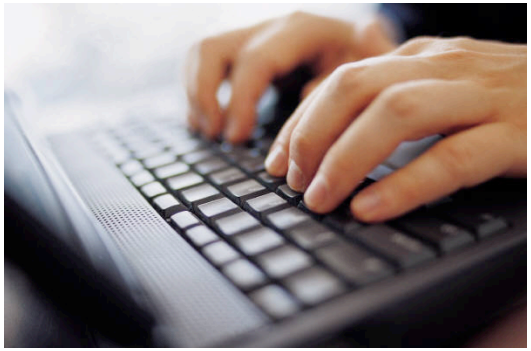
Some things we've learned from the MC Simulation and Reconstruction so far …

- Background rates
- Calorimeter inefficiency due to FDC cables and BCAL/FCAL gap
- Cathode strips ***really*** help to exclude ambiguities that would exist in a wires-only design
- Close-packing benefits us more from extra layers than from additional L-R resolving power in axial layers

Reconstruction Software Status

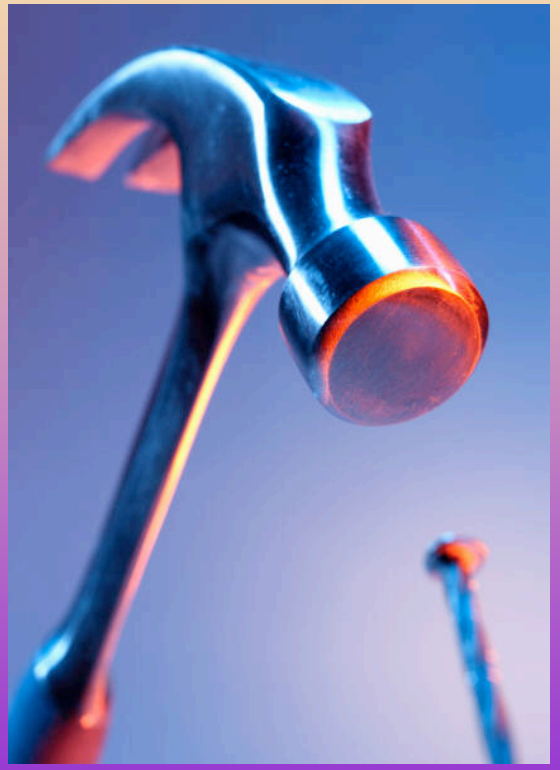
- Particle reconstruction continues for both neutrals and charged. They are not being used together for full event reconstruction by anyone (that I know of) at the moment





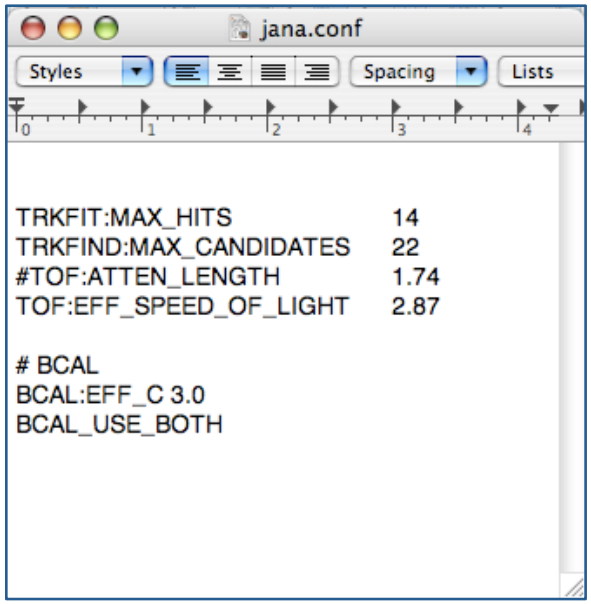
- PID, TOF, and Start Counter reconstruction still need work on integration with tracking. No recent repository activity

Recent developments in the JANA Framework

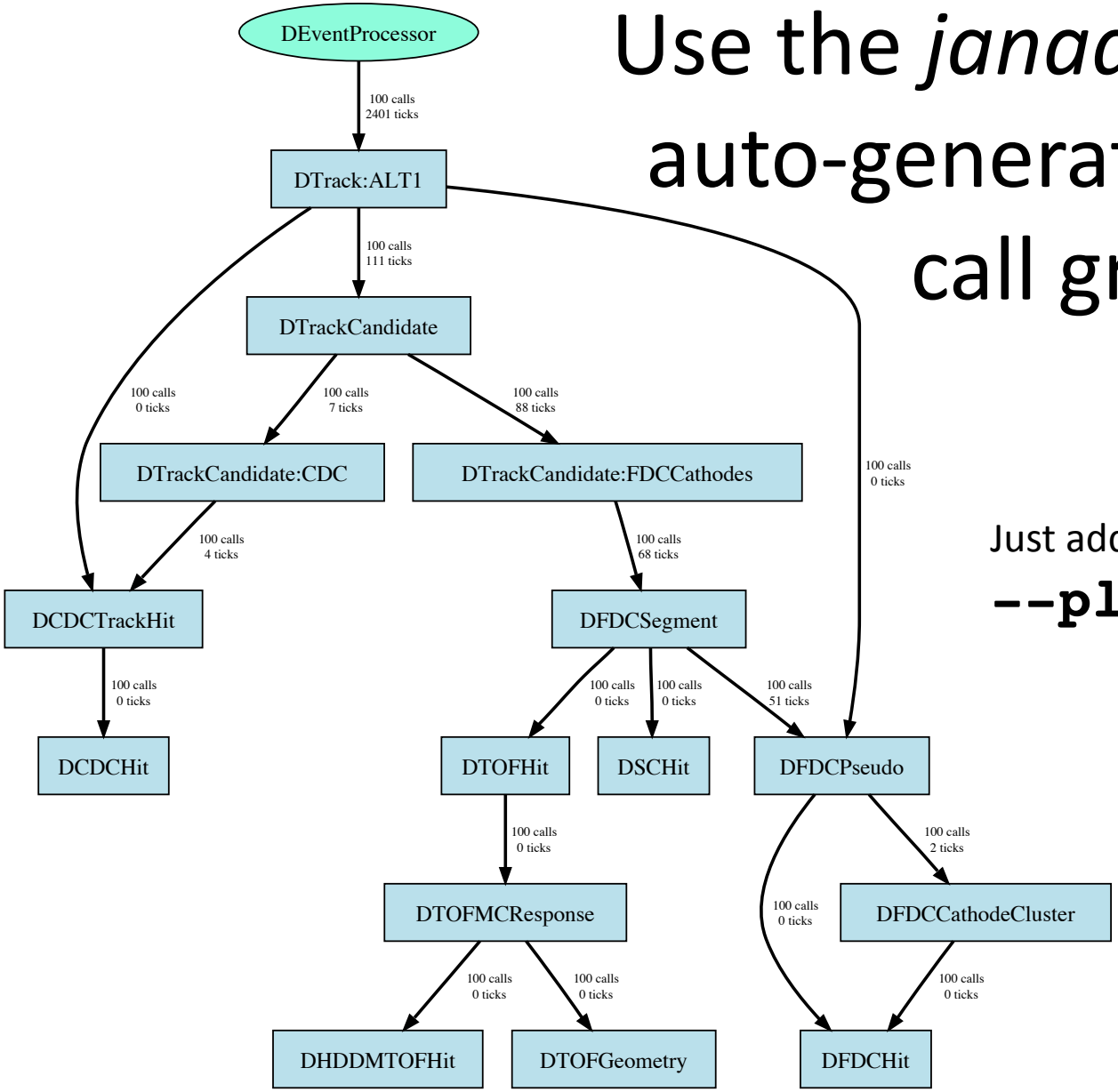


New command line options

- --config=*filename*
  - Simple ASCII format
  - key value separated by space
  - one parameter per line
  - "#" indicates comment to end of line
- --auto_activate=*factory*
- -PEVENTS_TO_SKIP=*Nskip*
- -PEVENTS_TO_KEEP=*Nkeep*
- -PTHREAD_TIMEOUT=*seconds*



Use the *janadot* plugin to auto-generate a factory call graph



Just add this to command line:

`--plugin=janadot`

Create ROOT files from objects in JANA using the *janaroot* plugin

- Objects define a representation of themselves in their toString(…) method

```
16  class DMCThrown:public DKinematicData{
17     public:
18        JOBJECT_PUBLIC(DMCThrown);
19
20        int type;         ///< GEANT particle ID
21        int pdgtype;      ///< PDG particle type (not used by GEANT)
22        int myid;         ///< id of this particle from original generator
23        int parentid;     ///< id of parent of this particle from original generator
24        int mech;         ///< production mechanism of this partcle (generator specific)
25
26        void toStrings(vector<pair<string,string> > &items)const{
27           AddString(items, "type", "%d", type);
28           AddString(items, "pdgtype", "%d", pdgtype);
29           AddString(items, "myid", "%d", myid);
30           AddString(items, "parentid", "%d", parentid);
31           AddString(items, "mech", "%d", mech);
32           DKinematicData::toStrings(items);
33        }
34
35  };
```

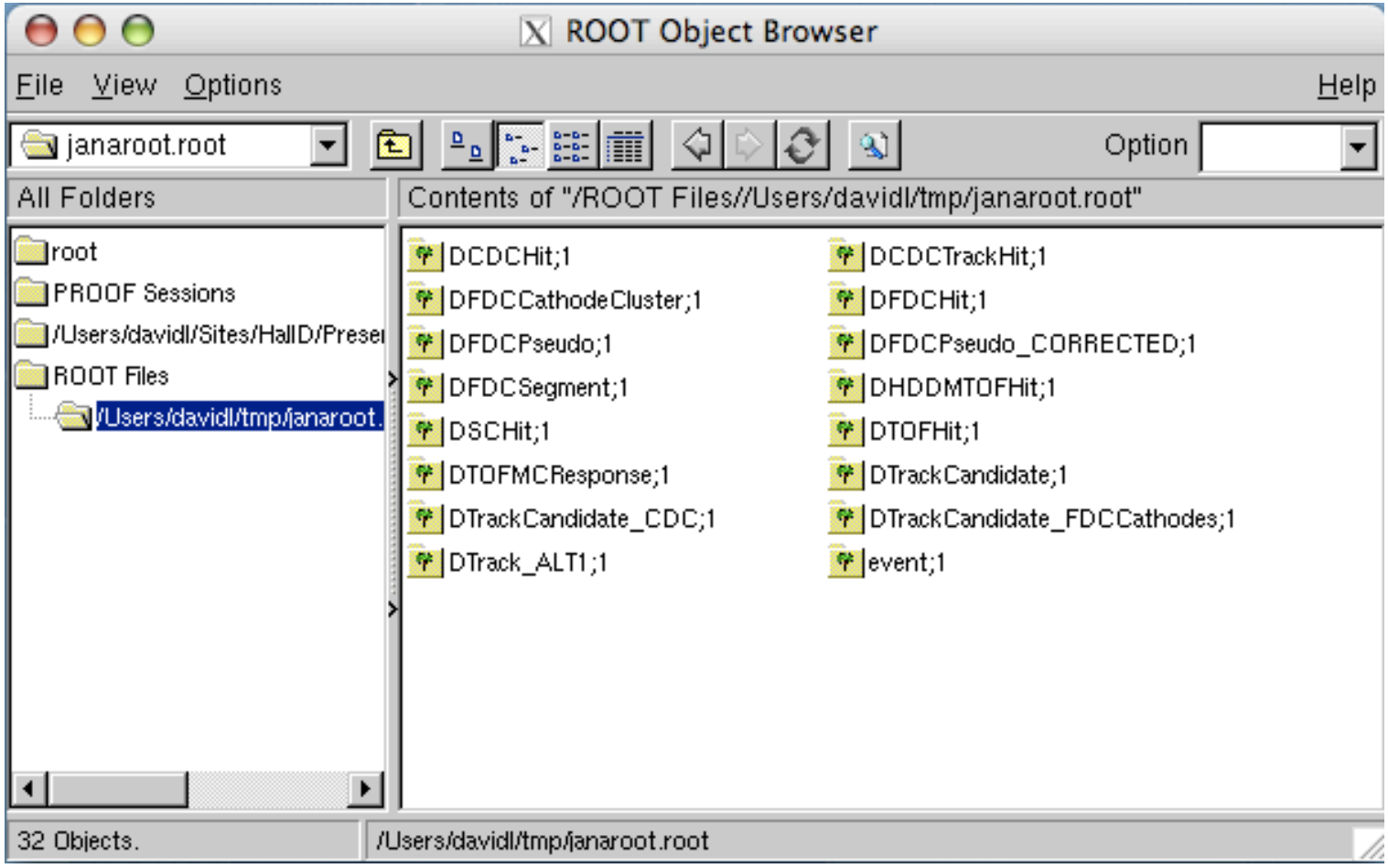
Using the *janaroot* plugin

A simple example:

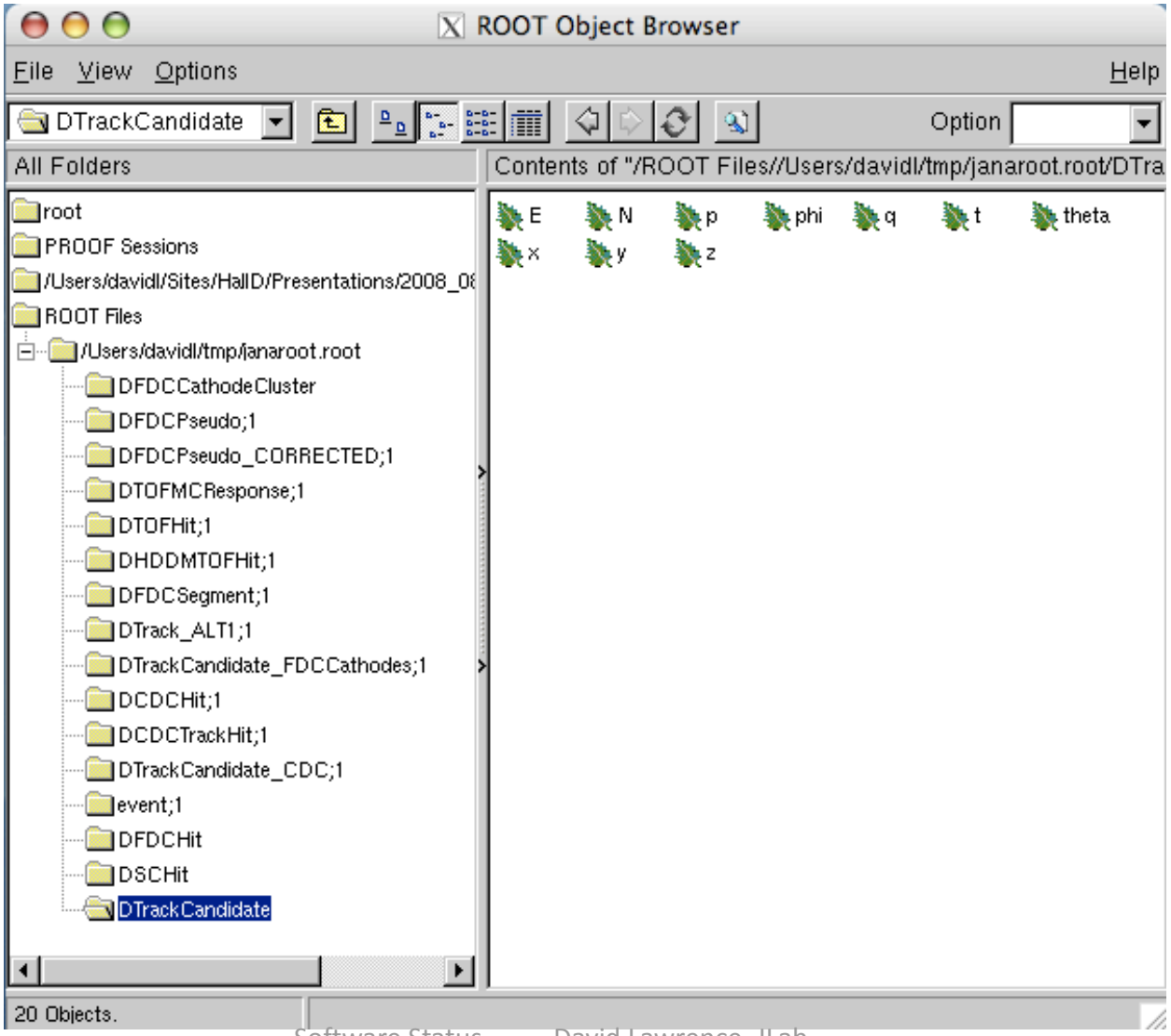
```
hd_ana –plugin=janaroot –auto_activate=DTrack:ALT1 hdgeant.hddm
```

This will create a file called “janaroot.root” and *TTree*s will automatically be defined for each factory that produces objects during this job.

TTrees automatically defined by *janaroot*



Auto generated *TLeaf* example



“event” is everybody’s friend!

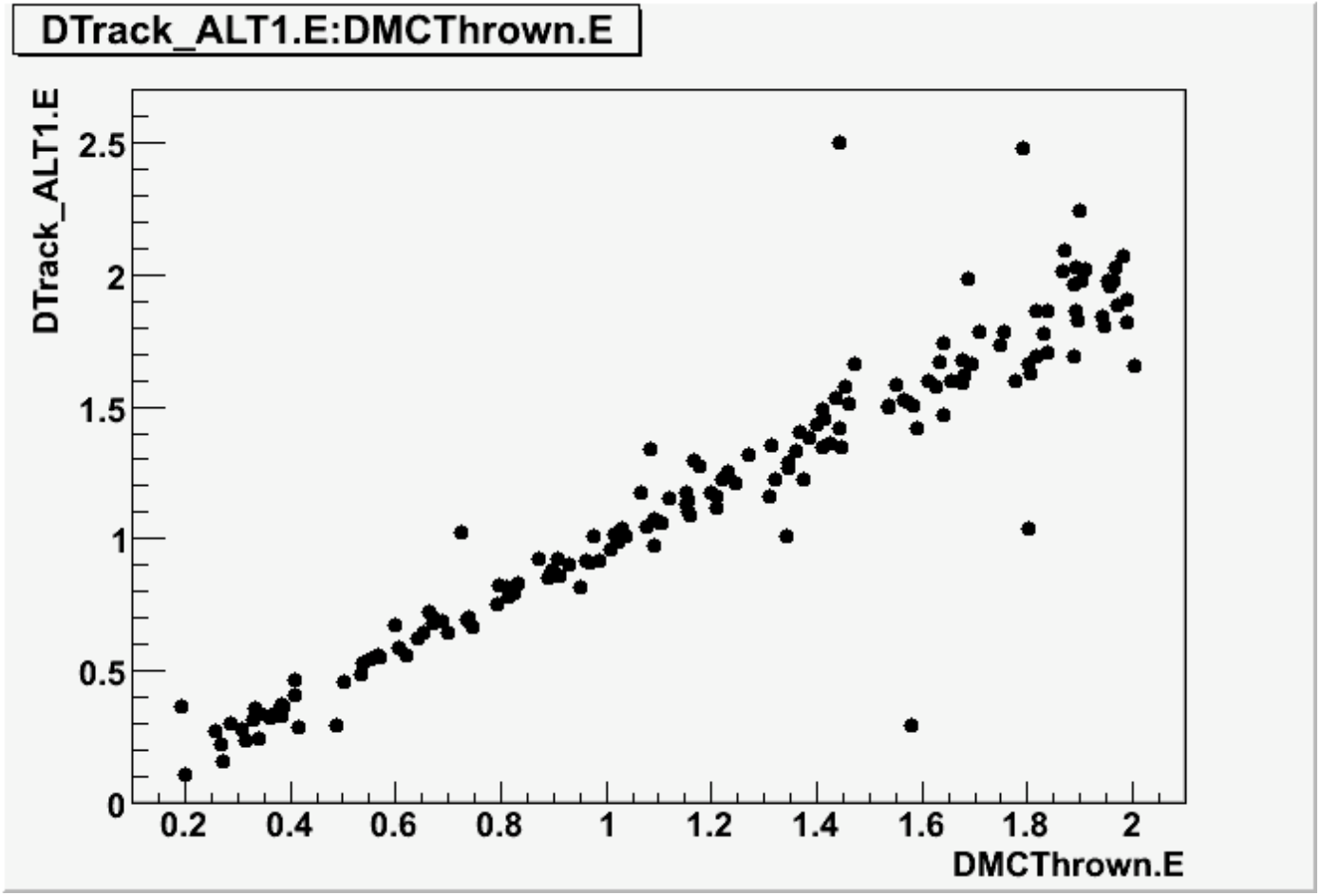
The *event* tree is created just before closing the ROOT file and has all other trees added as “*friend*”s.

The following two lines will result in identical plots

```
DTrack_ALT1->Draw("E")
event->Draw("DTrack_ALT1.E")
```

This allows one to plot members of one object vs. another.

Example: Reconstructed vs. Thrown Energy for Charged Tracks



One last note on JANA …

JANA will be presented at the ACAT2008 Workshop at Erice, Sicily November 3-7

Find the abstract on the GlueX wiki on the "Conferences" page

Summary

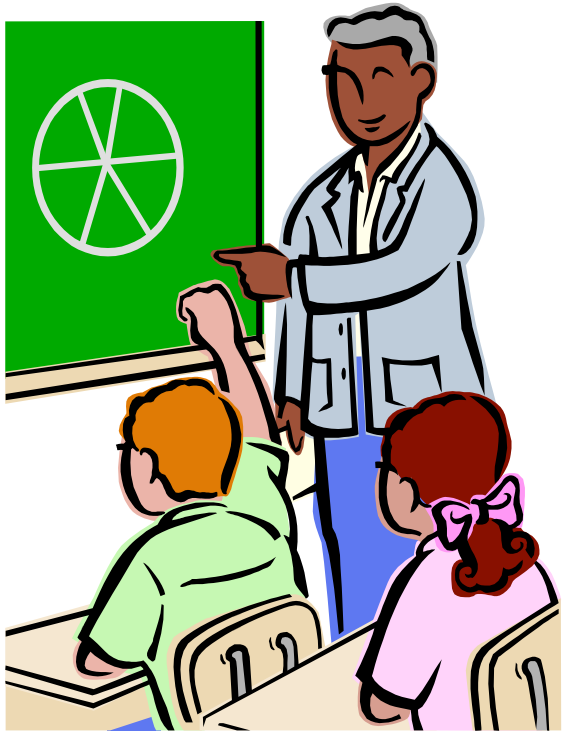
- Software Tasks List:
  http://www.jlab.org/Hall-D/software/Software_tasks.php

- JANA/DANA Wiki page:
  http://www.jlab.org/Hall-D/software/wiki/index.php/JANA/DANA

  - New bi-weekly software Meeting time:

Wednesday at 14:00 JLab time

Backup Slides



Other modifications

- Improved response to 3 or more SIGINTs (ctl-C) to try a hard exit
- Launch new thread if old one is killed for being non-responsive
- Exit with error if plugin is specified but not found