

# Using the e/gamma D3PD

An end user view

# Outline

- Some useful ATLAS resources
  - <https://twiki.cern.ch/twiki/bin/view/AtlasProtected/D3PDMaker>
    - describes the d3pd maker
  - <https://twiki.cern.ch/twiki/bin/view/AtlasProtected/D3PD>
    - lists available d3pd's
  - <https://twiki.cern.ch/twiki/bin/viewauth/Atlas/GoodRunsListsTutorial>
    - good run lists use – in particular root usage is listed here
  - <https://espace.cern.ch/atlas-egamma/Lists/Runs%20and%20LB/Attachments/4>
    - good run list endorsed by the egamma group (generally no concern for muon items but solenoid/tracking&Calo okay)
- Stroll through the use and application of the above
  - Some local resources which might be useful are indicated along the way

# D3PD making

- Issue free!
  - the e/gamma d3pd is the only piece of ATLAS software that I know of that for a well distributed release (say 15.6.1) does not start with:
    - first do a “cmt co BlahBlah” on a half dozen packages
  - it simply runs out of the box
  - you don't even need to run it (several options)
    - datasets are available on the grid for the first processing
    - shifts are organized for doing the reprocessed (r988) collision data
    - we have the full reprocessed set of e/gamma D3PD's on disk here (~1/2 GB)
      - look at `~reb/d3pd_analysis/15.6.1/analyze/run_analysis.C`
        - » this job runs on the local copy and makes some simple histograms
        - » applies the egamma goodrun list
  - You can see an example (messier than it needs to be simply because the latest tags for the good run list stuff is included) on:
    - `~reb/d3pd_analysis/15.6.1`
  - even simpler (no special tags) – the run directory has a couple of pathena submission scripts (this was used for first D3PD run shift)
    - `~reb/d3pd_shift/15.6.1`



# Good Run List

- See resources in slide two
- the short story
  - need to check out specific tags (in particular probably only the DataQuality/GoodRunsList one is likely needed)

```
cmt co -r GoodRunsListsUser-00-00-08 DataQuality/GoodRunsListsUser
cmt co -r GoodRunsLists-00-00-67 DataQuality/GoodRunsLists
cmt co -r LumiBlockComps-00-00-78 LumiBlock/LumiBlockComps
cmt co -r CoolRunQuery-00-01-89 Database/CoolRunQuery
```

- Go to DataQuality/GoodRunsLists/cmt and
  - “make -f Makefile.Standalone”
- symbolically link the library into your run area
  - GoodRunsListsLib.so ->  
../DataQuality/GoodRunsLists/StandAlone/GoodRunsListsLib.so

## Good Run List (cont.)

- In your “makeclass” program

```
Root::TGoodRunsList grl;  
Root::TGoodRunsListReader grlReader;  
grlReader.SetXMLFile("EGamma_FinalGoodRun900GeV.xml");  
grlReader.Interpret();  
grl=grlReader.GetMergedGoodRunsList();  
grl.Summary();
```

- In the event loop

```
if(grl.HasRunLumiBlock(RunNumber,lbn) ) {...
```

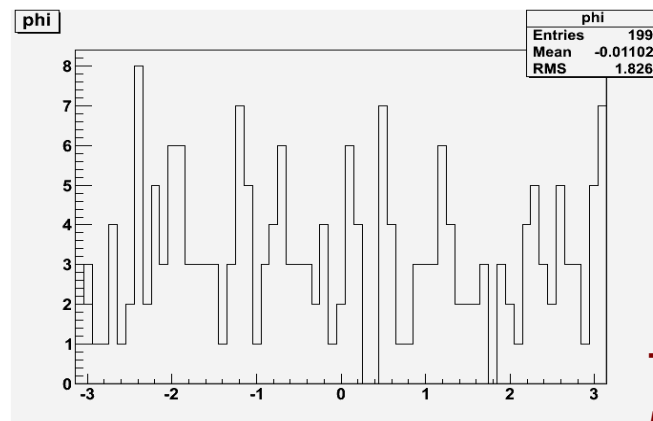
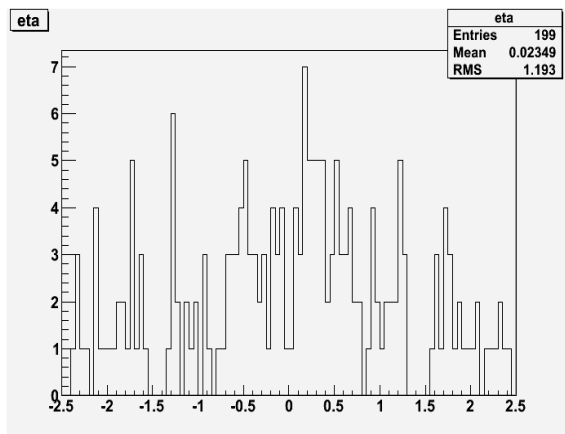
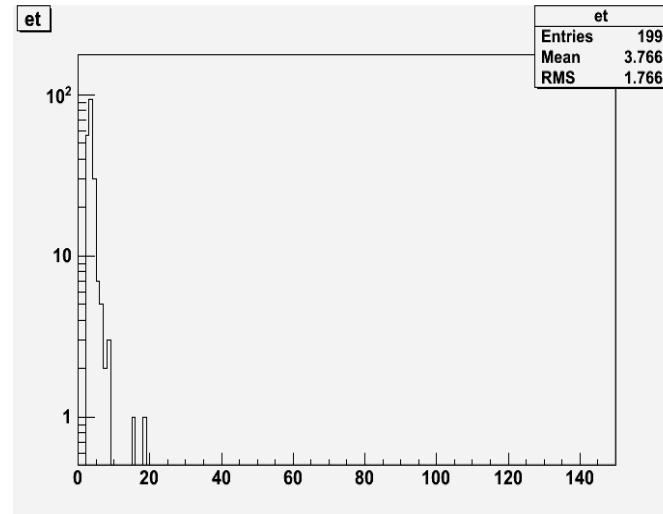
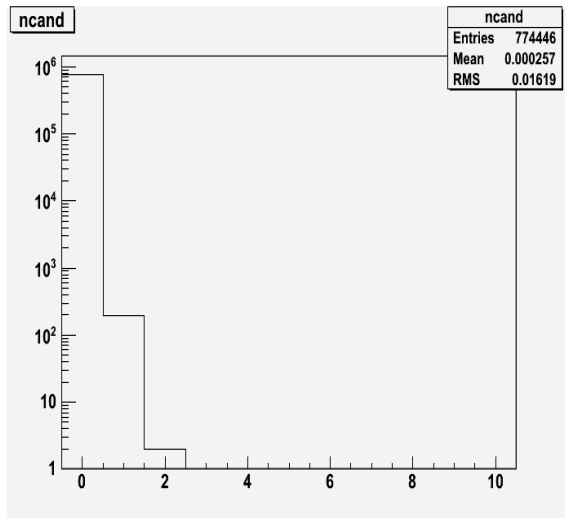
```
OBJ: Root::TGoodRunsList      MyLBCollection notitle  
--- TGoodRunsList      : Version: 2.1  
--- TGoodRunsList      : Metadata: Query : find run 141000+ and dq lar,pix,sct,trtb,trte y+  
and dq til g and dq atlsol g and mag s and LHC stablebeams true andlhc beamenergy  
449-451  
--- TGoodRunsList      : Metadata: RunList :  
142383,142195,142193,142191,142189,142174,142171,142166,142165,142154,142149,  
141811,141749  
--- TGoodRunsList      : Metadata: SVNVersion : CoolRunQuery-00-01-80  
--- TGoodRunsList      : Number of runs: 13
```

# What is in it

- Triggers appear as individual binary values with trigger name
- lumiblock (lb), RunNumber ...
- generally all useful data from the AOD for photons/electrons...
  - see Scott's talk for naming conventions (pretty obvious)
    - <https://twiki.cern.ch/twiki/bin/view/Atlas/AODClassSummary15>
      - this “documents” the AOD contents which are generally mirrored in the D3PD
  - these items are all in the “physics” tree and appear as vectors so you can loop through multiple candidates
    - see `~reb/d3pd_analysis/15.6.1/eGamma.[Ch]` for an example



# Example plots



loose photon  
candidates  
Et > 1 GeV  
|η| < 3.5  
not in the  
1.5ish range

774446 events total  
513870 good run ev.  
260576 bad run ev.



# Future

- Jae Yu has taken up the task of soliciting input and continuing this as an official e/gamma resource (has been endorsed by e/gamma CP group)
  - previous shift activity deposited the data in user datasets (these don't have infinite life) so this will change
  - should become part of normal production provided the e/gamma and relevant physics groups agree they are useful

