



L1 Simulation Readiness Review

System Issues
August 1st, 2005
SLAC

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Readiness Criteria



Simulation readiness

- L1A decision (L1 line rates)
- L1A mean time (t0 input)
- TSF segments (L3 tracking)
- L1A width (potential impact on SVT/DIRC)

Listed in rough priority order (my view)

Even L1 decision irrelevant for 95%
of BaBar physics...

Integration readiness

- Configuration works properly
- Full Run1-Run5 samples can be produced
- L1 outputs are unchanged for downstream consumers

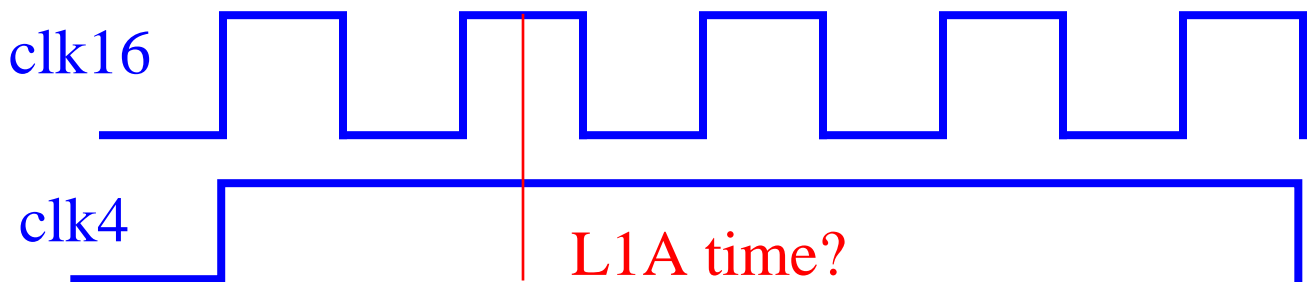
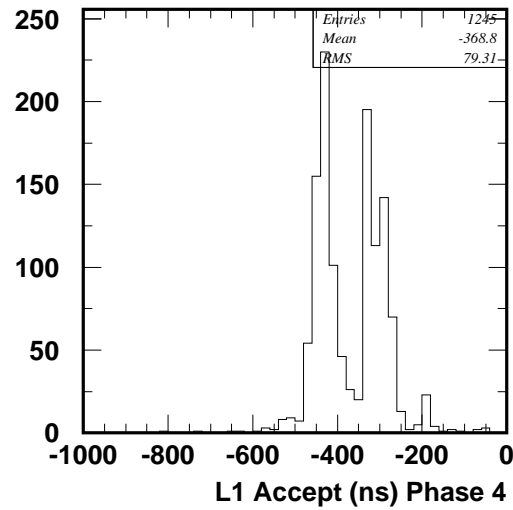
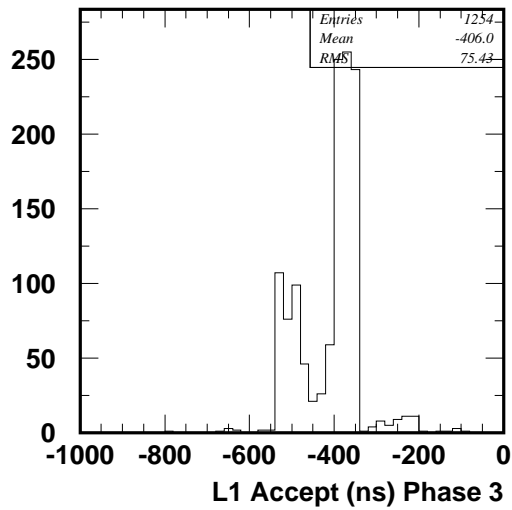
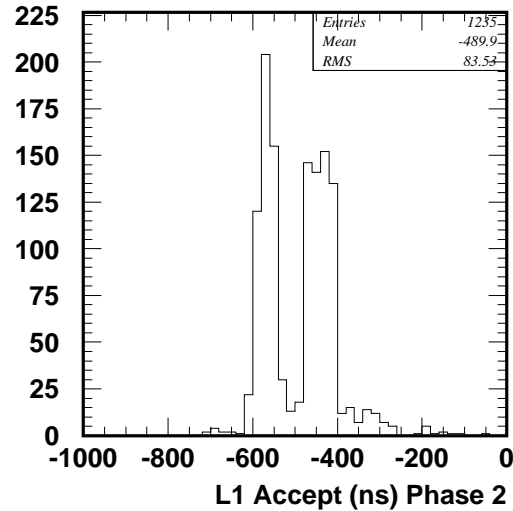
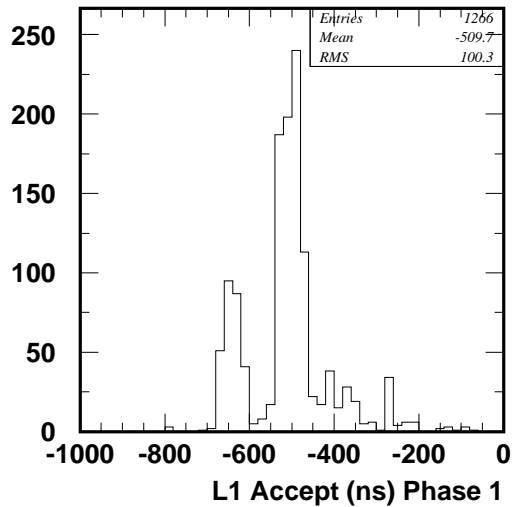


GLT Timing



Bhabha May2004 NewSim

2005/08/01 08.18



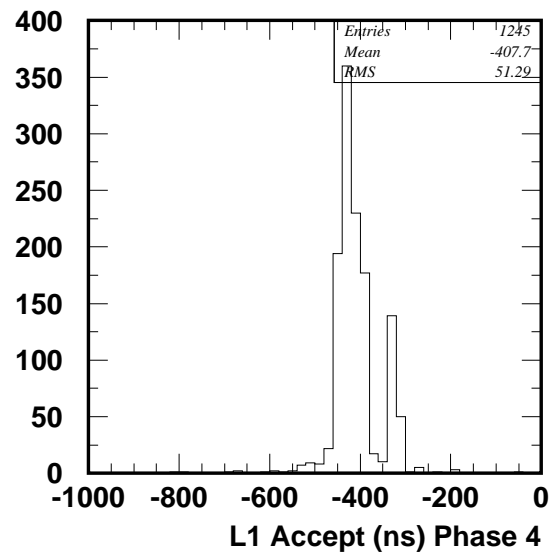
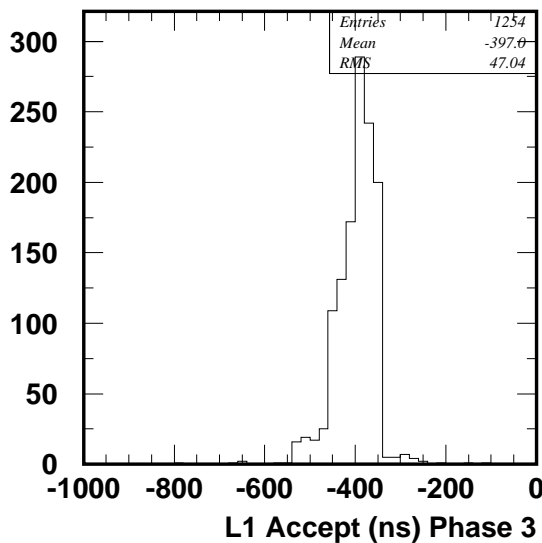
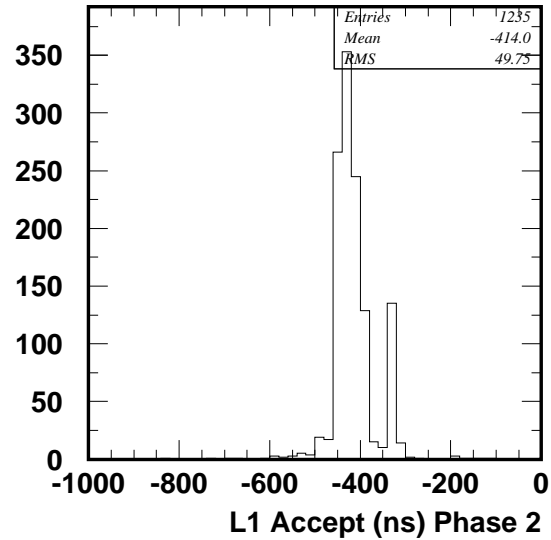
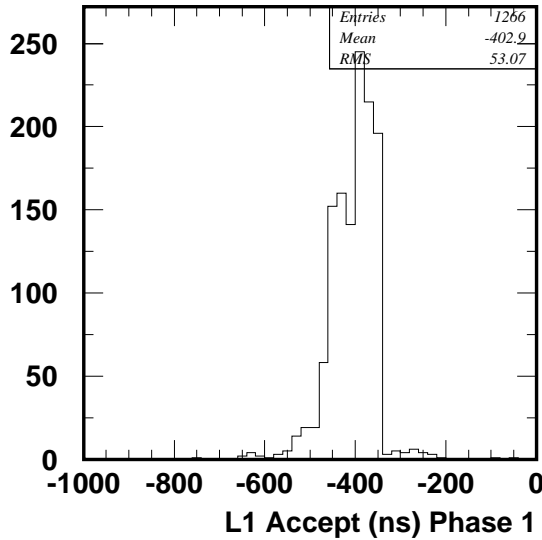


trgDC L1A time



Bhabha May2004 trgDC

2005/08/01 08.18



Have historically struggled with this

Timebuffers were designed to solve this problem

Should be diagnosed quickly...



New-Old Switching



Need to decide which trigger boards to simulate

TrigConfig - TRGGLTSOURCES

Listing of all modules contributing to trigger
BLT EMT PTD ZPD

L1DctSimSequence

```
if {[string first "ZPD" $TRGGLTSOURCES]<0} {  
  ErrMsg routine "L1DctSimSequence:  
  ZPD not found in TRGGLTSOURCES,  
  disable L1DZpdSimSequence"  
  sequence disable L1DZpdSimSequence  
}  
  
if {[string first "PTD" $TRGGLTSOURCES]<0} {  
  ErrMsg routine "L1DctSimSequence:  
  PTD not found in TRGGLTSOURCES,  
  disable L1DPtdSimSequence"  
  sequence disable L1DPtdSimSequence  
}
```

Will need to be extended for future firmware changes

Could use conditions. Currently PTD vs ZPD is being used as a time marker. **Easiest solution now.**

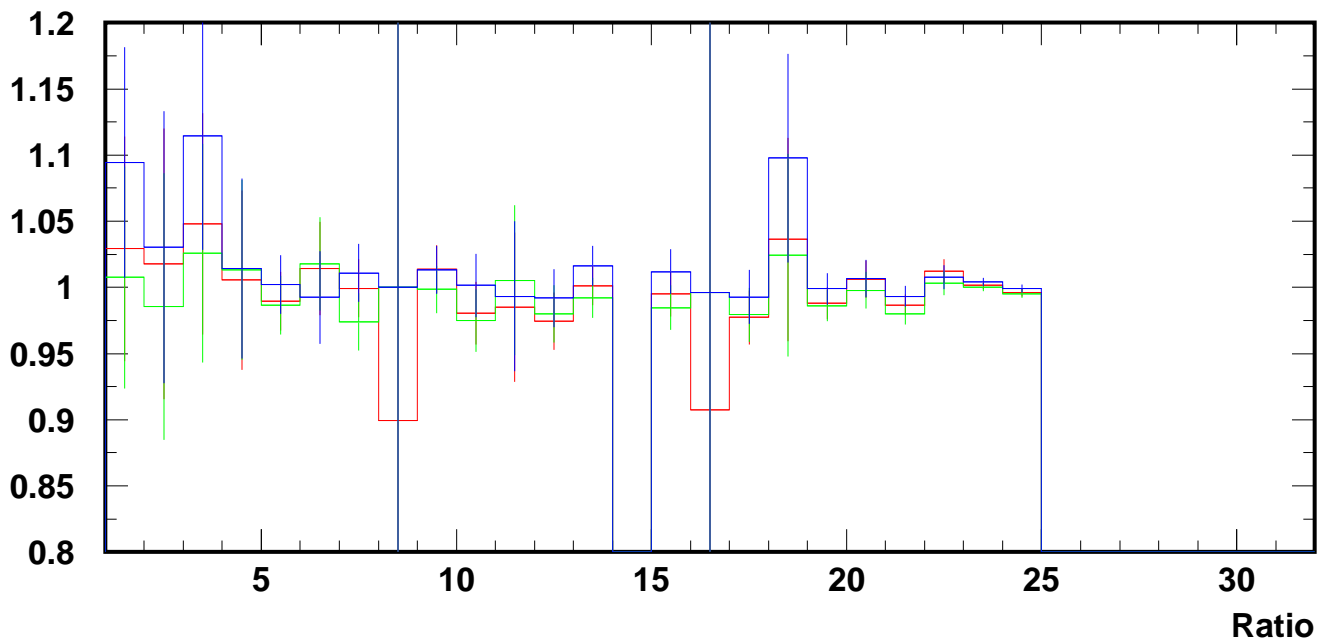
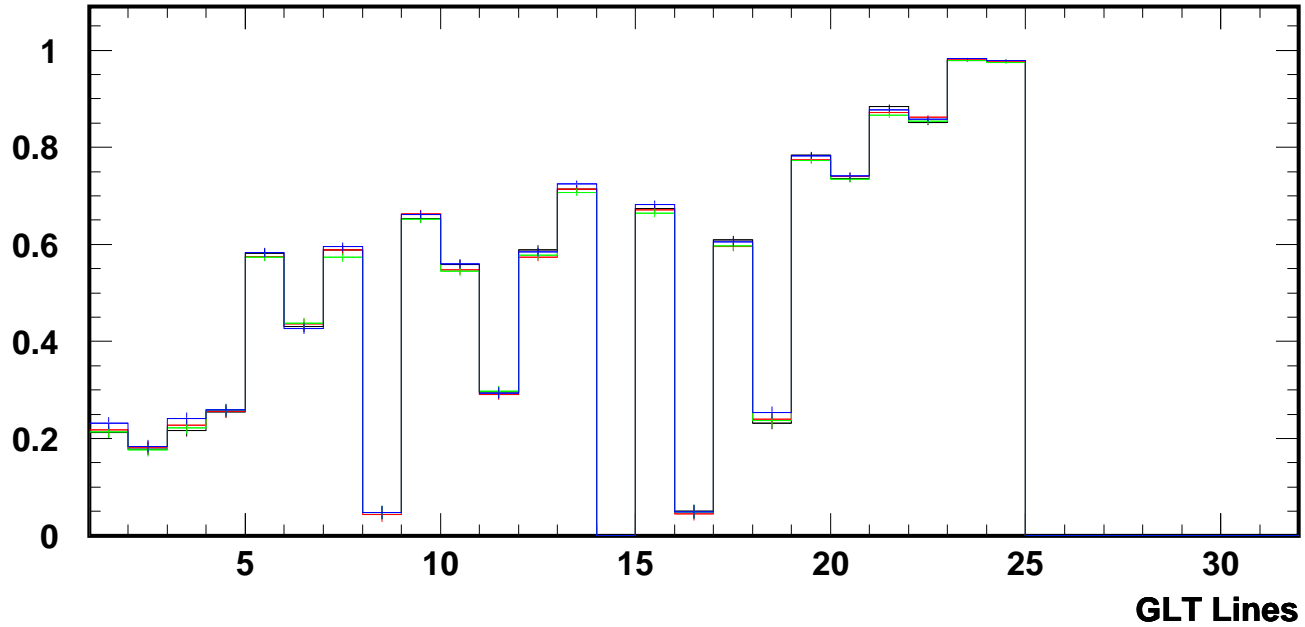


Older Data



L1Sim 2001-2004 Tau

2005/08/01 02.36



Tau events with backgrounds from 2001



Pulling the Trigger



```
Moose/AppUserBuildNewL1Sim.cc
#define SIMAPP_NEWL1SIM
#include "Moose/AppUserBuild.cc"
```

In nightly for last 2 months

```
Moose/AppUserBuild.cc
#ifdef SIMAPP_NEWL1SIM
    // New code here
#else
    // Old code here
#endif
```

**Necessary changes to production code
already in place, just not enabled by default**

**90% of changes (including tcl) is simply a matter
of commenting/uncommenting the #ifdef statements**

A couple of things need to be renamed (DigiMakers)

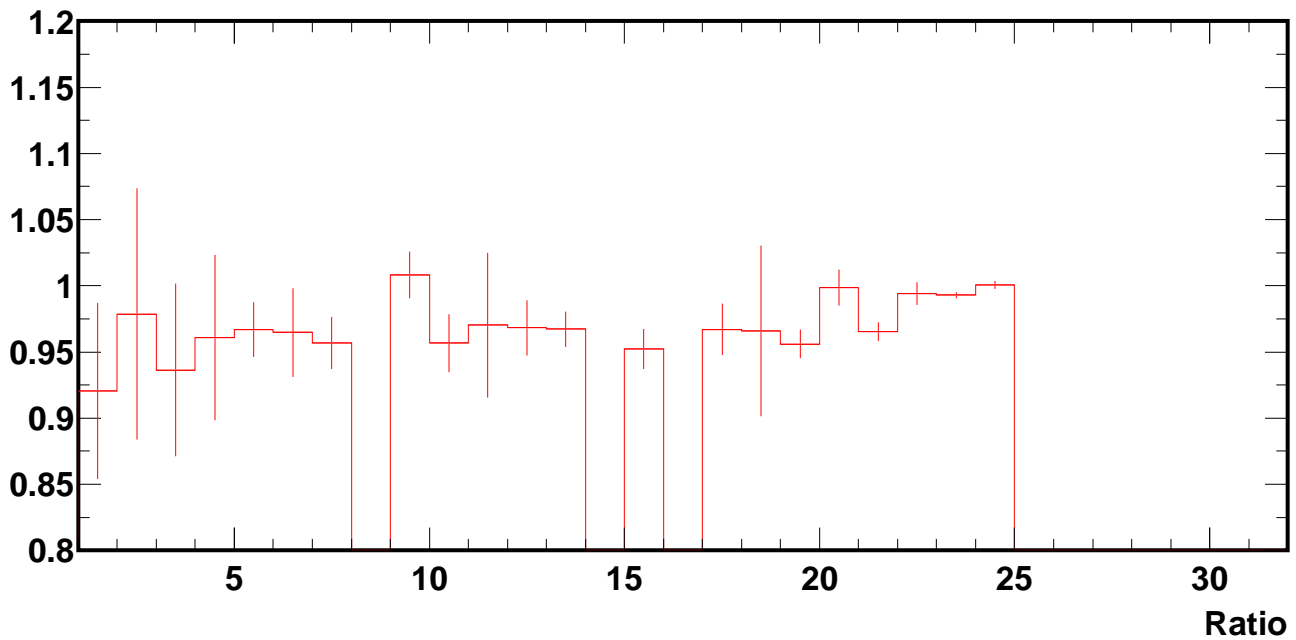
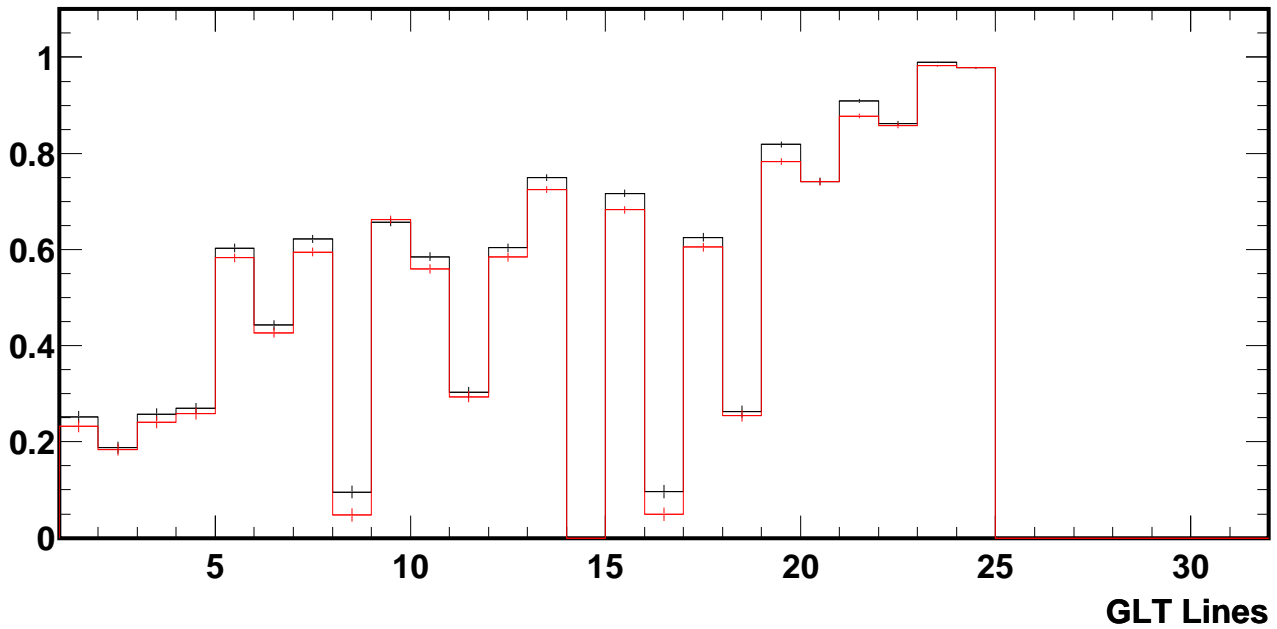
Can install this code reliably in short order...



trgDC-newSim Rates



trgDC-L1Sim Tau



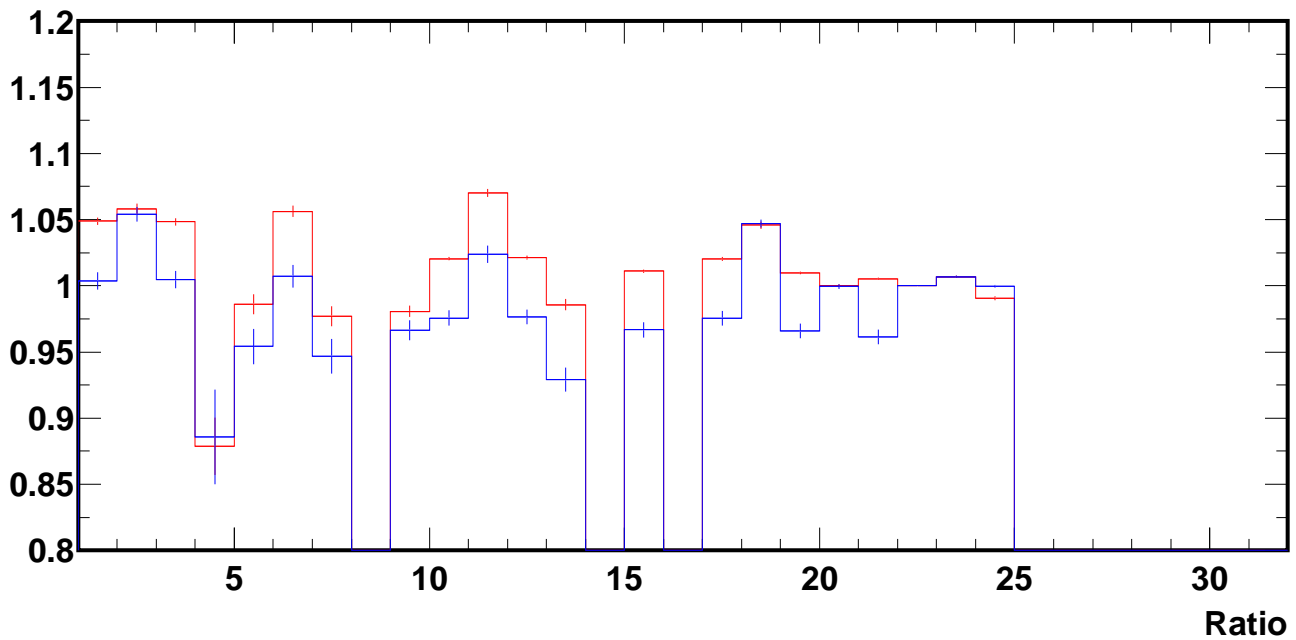
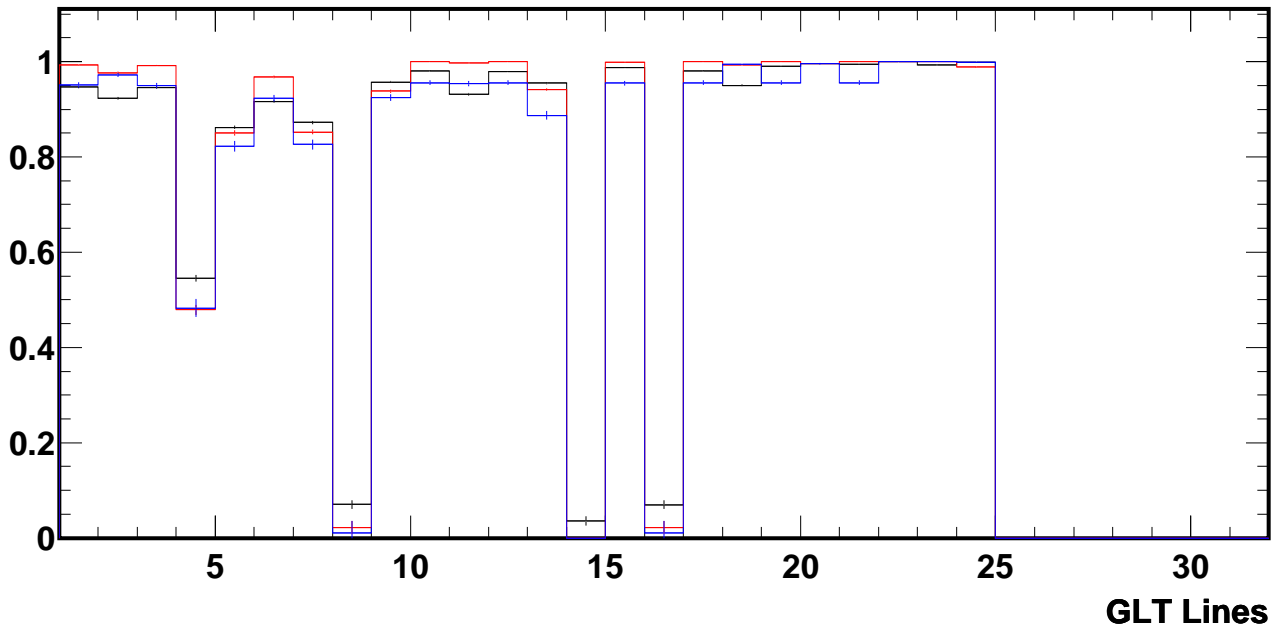
trgDC - newSim



2004 Hadronic Events



May2004 Hadronic line rates



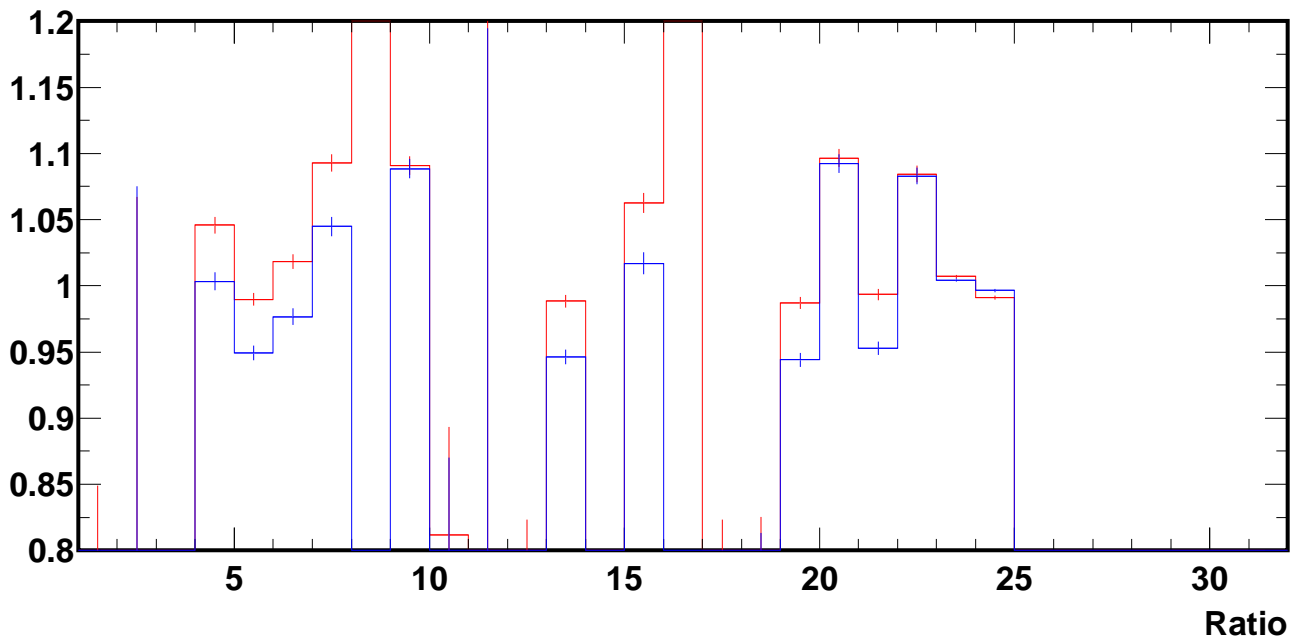
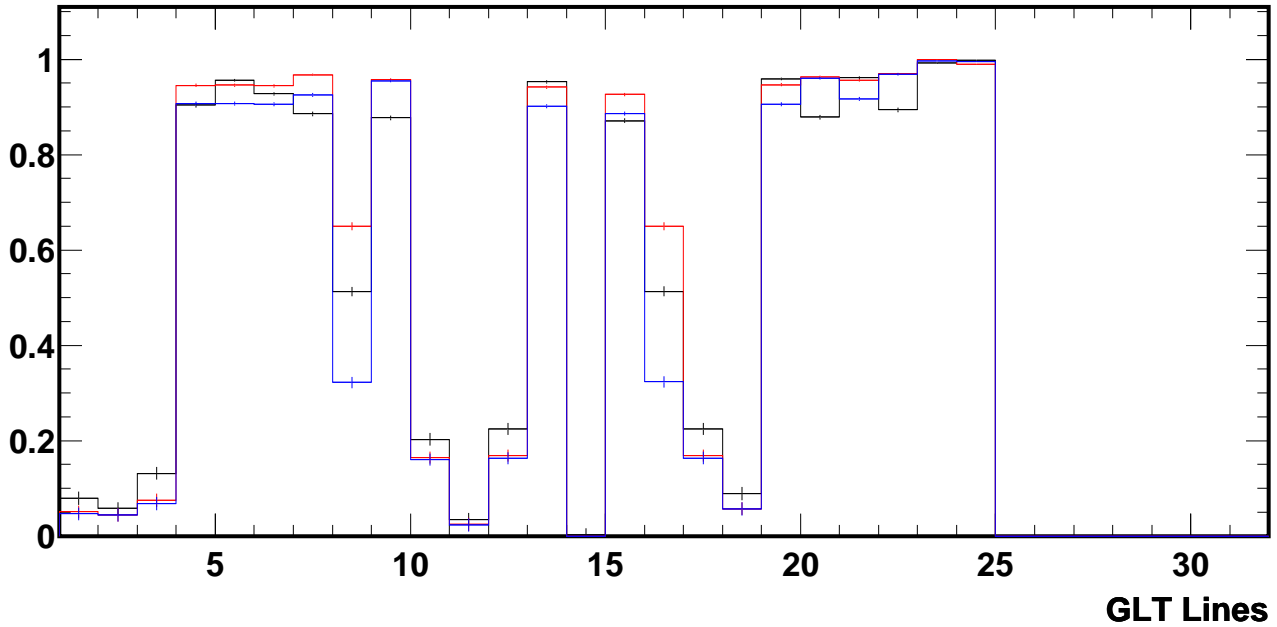
r48145 - trgDC - newSim



2004 Bhabha Events



May2004 Bhabha line rates



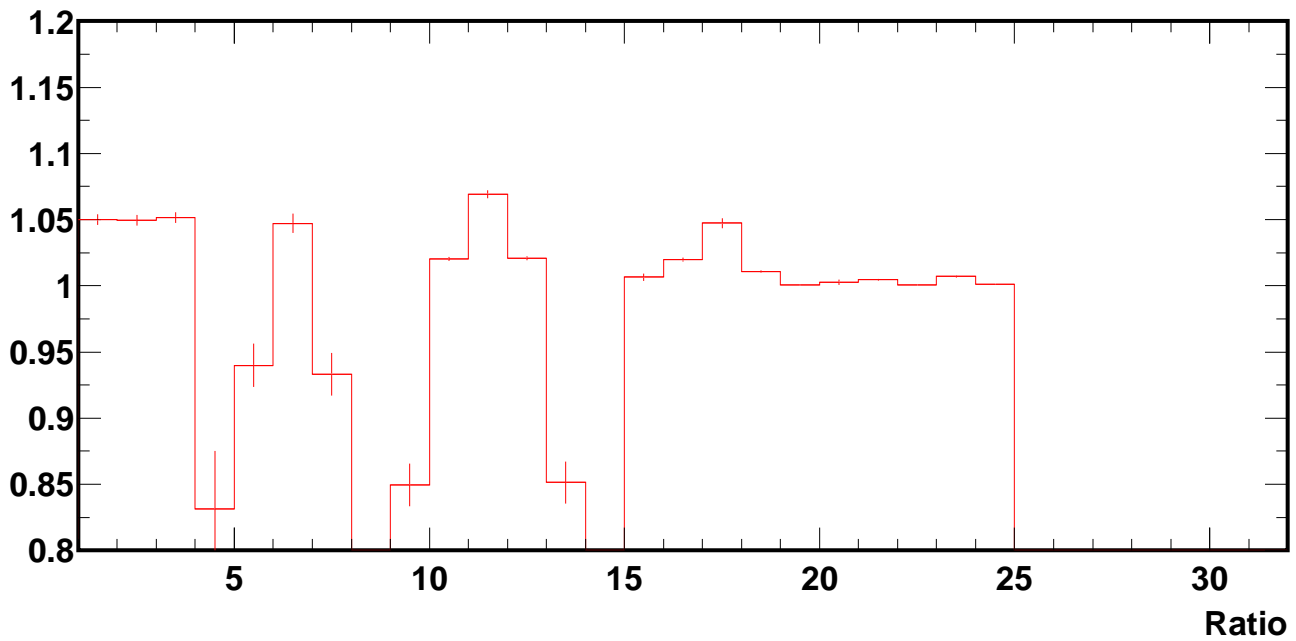
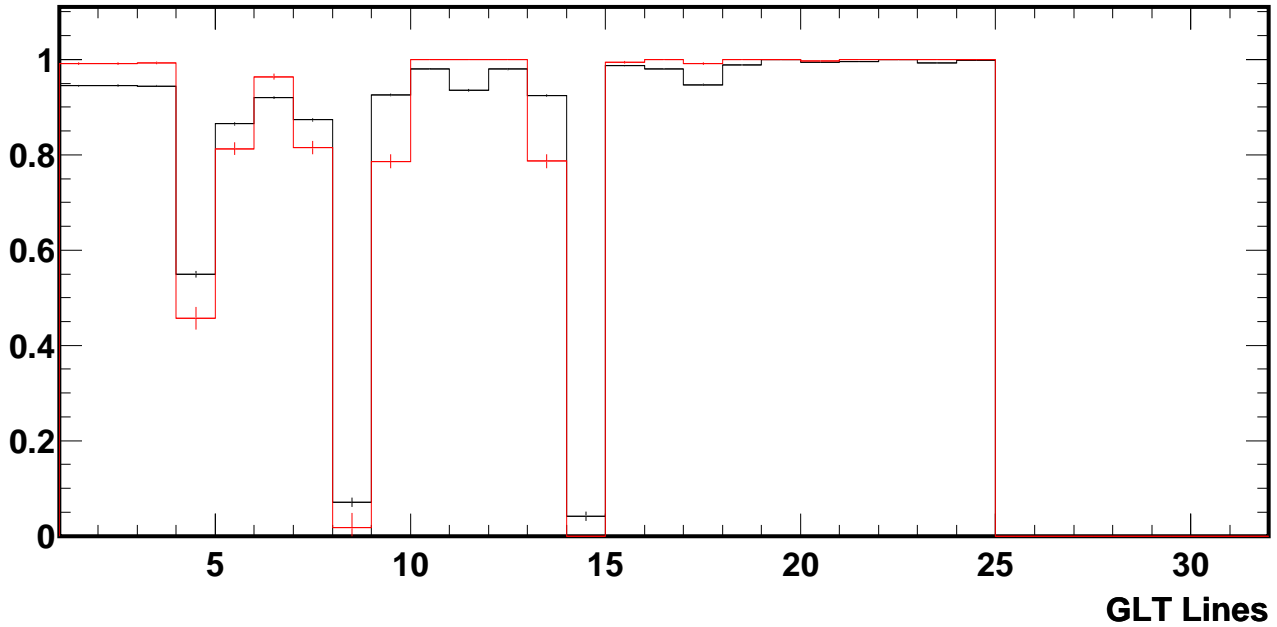
r48145 - **trgDC** - newSim



2005 Hadronic



May2005 Hadronic line rates



r48145 - newSim



RecoBGFilterMon (5k May2004)



BGF	ee new	ee old	$\mu\mu$ new	$\mu\mu$ old	$\tau\tau$ new	$\tau\tau$ old	BB* new	BB old
2PhoN	2	0	50	49	0	0	0	5
Isr	20	21	377	380	156	160	13	2
Mu	1	1	73	73	2956	2960	0	0
MHad	25	26	1336	1338	16	15	4933	4926
NHad	2	2	276	273	1	1	27	21
PhiGam	0	0	2	2	21	20	0	0
Rad2pr	16	13	11	12	139	140	0	0
Tau	125	129	1814	1822	385	383	6	14
2Pho2tr	13	13	245	244	110	110	0	3
2Pr	10	10	461	462	3235	3243	0	0



Physics Validation



It would be very nice to have some physics yields to check

Difficult and time-consuming for us to set this up

With MooseAppNewL1Sim, can readily produce real validation and QA samples

Apologies for not getting anything more concrete ready for this review



Remaining Work



Critical

- Track down t0 broadening
- Check current nightly (activity this week)
- Production-ize everything (no cout calls...)
- Check L3 tracking with current code

At that point, I would be ready to argue for installing this for production validation

Would be nice

- TSF-BLT data path teststand validation
GLT teststand validation?
- Improve PTD accuracy, TSF inputs
- Run5 backgrounds (can be done now)
- Conditions DB...
- Documentation

Not important enough to hold up deployment for validation tests and QA