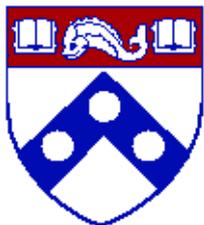

Plans for TRT high threshold calibration

Sarah Heim

10.29.2013



High threshold (HT) calibration consists of 3 parts:

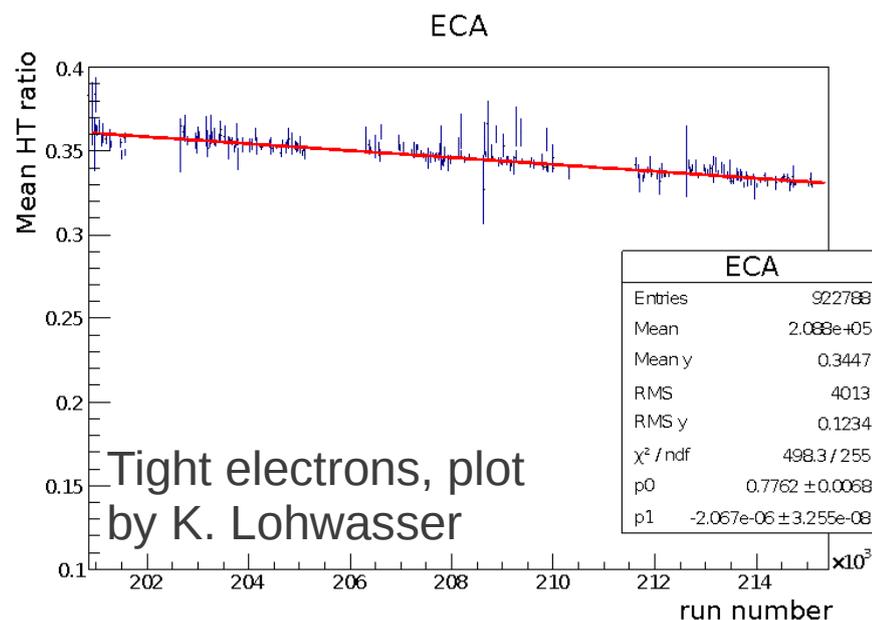
- optimization
- equalization
- possible compensation of radiation damage

Why should we think about it?

- different pileup conditions (might affect optimization)
- possible changes in electronics (small voltage changes etc.)
- saw changes in test pulse rates and in high threshold ratio efficiencies

during 2012

- due to radiation damage
- test pulse/noise studies show flattening out, so it is not clear if continuous high threshold calibration is necessary, but we should be prepared



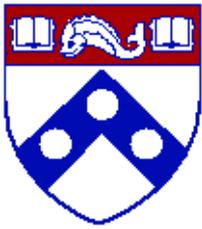


1. Setting up machinery before the next run:

- run optimization on 2012 data
- run equalization on 2012 data
(and put variables needed for this into calibration ntuples for future)
- develop procedure for using test pulses to correct for radiation damage

2. During the run

- run the equalization tool regularly to check for radiation damage
- run HT test pulse
(translate shifts in calibration results to threshold changes)
-
- monitoring of trigger/ID efficiencies in $Z \rightarrow ee$ events online?



1. HT reoptimization

- get code from Kevin Finelli
- run optimization using 2012 data

*Limited duration.
Probably ok for
qualification
task?*



2. HT equalization using particles

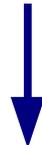
- use Richard Wall's code
- put needed variables into calibration ntuples
- run equalization using 2012 data
- run regularly during run 2

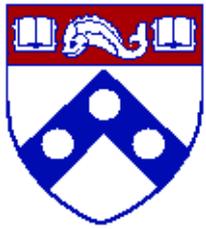
*Need someone
who can start
next year and
stick around for
some time
during data
taking (probably
still ok for
qualification
task, if further
commitment
possible)*



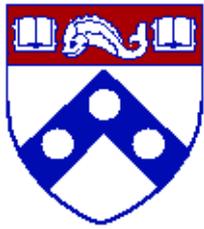
3. HT calibration using test pulses

- develop procedure:
 - obtain reference values at the beginning of run 2
 - changes in the test pulse results during the year should be directly translatable into necessary changes of the threshold
- interplay/cross-checks with equalization from particles





BACKUP

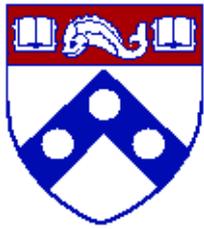


- Optimization: done using pions, electrons (first test beam, then collision)
- Equalization: done using first cosmics, then pions
- people working on this and similar things in the past
(list probably incomplete, but possible sources for code and advice):

Richard Wall, Sasa Fratina, Ben LeGeyt, Jahred Adelman,
(equalization/optimization)

Liz Hines, Kevin Finelli (optimization)

Ryan Reece (LT calibration)



Richard Wall's code for equalization using pions:

</afs/cern.ch/user/s/sheim/public/HLEqualization/>

Links to talks (by Richard Wall):

04/2011

02/2011 “Main physics goal: set thresholds such that HL hit probability for low momentum pions is uniform across the TRT”

10/2010

05/2010 “Use sample of good tracks (require silicon hits, no pt cut)
Fit a polynomial to strawlayer distributions to account for geometric systematics”

03/2010 “Project was started using cosmics data

Most recent set of corrections made with 2009 collision data”

Link to TRT low threshold calibration note