Follow-up on Trigger Package Problem

- Leon identified problem in TkrDigi which caused TkrDigiCol to be made with no valid hits.
- This caused a problem in the Trigger Package (TriggerAlg.cxx and ThrottleAlg.cxx…C&A 3/13/06 Mtg)
  - Three-In-A-Rows Bits were incorrectly set
  - Throttle Bits were incorrectly set
- Two Impacts on Hardware Trigger Rate
  - False Events Pass: $Tkr = 1_{\text{false}}; Tkr = 0_{\text{true}}; CalLo = 0; CalHi = 0$
    - In a sample of 2270 $(Tkr \& (!\text{Veto}) || CalLo)) || CalHi$, 106 falsely passed
  - True Events Vetoed: $Tkr = 1_{\text{true}}; Tkr = 1_{\text{false}}; CalLo = 0; CalHi = 0$
    - 60 Events were falsely vetoed;
- **Net Effect is 2270 $\rightarrow$ 2224, which is a 2% reduction in the hardware trigger rate.**
  - Size of effect confirmed with larger statistics (see last week’s table)
Impact on Trigger+Filter

- The impact on the rate after the OnboardFilter.
- **106 False Events** that mistakenly passed Hardware Trigger:
  - 68 passed OnboardFilter (FilterStatus_HI == 0)
    - **Special Note:** If the OnboardFilter is presented with an empty event, no filter veto bits are set ➔ **event passes!**
    - Might worry about noisy trigger lines…perhaps we need simple selections in the filter to guard against this.
  - 38 fail OnboardFilter
- **60 True events** that are mistakenly rejected by Hardware Trigger
  - 1 passes OnboardFilter
  - 59 Fail the OnboardFilter
- **Net Effect Trig+Filter 441 ➔ 370, which is a ~15% drop in background rate.**
  - Size of effect confirmed with larger statistics (see table from last week).
- Note: Still investigating effects of small bugs in default EbfWriter which are fixed in newest version. Fixes not included in this discussion.