

# 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:  $Tkr = 1_{\text{false}}; Thr=0_{\text{true}}; CalLo=0; CalHi=0$ 
    - In a sample of 2270 ( $Tkr \& (!Veto || CalLo) || CalHi$ ), **106 falsely passed**
  - True Events Vetoed:  $Tkr = 1_{\text{true}}; Thr=1_{\text{false}}; CalLo = 0; CalHi = 0$ 
    - **60 Events were falsely vetoed;**
- **Net Effect is 2270 → 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.

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