TK Trigger Discussion

• What’s next?
• Simulation driven from TK Trigger Primitives
  - What questions to address?
    • Required input granularity/resolution to muon & cal triggers
    • Develop algorithms for track finding & matching
    • Concepts for system design: algorithm & architecture
    • Development of Requirements

• Feedback to Tracker upgrade design
  - Keep connections close and stay informed
  - Groups bring different perspectives to the problems
  - “You can’t always get what you want, but if you try, sometime you just might find you get what you need.”  (Jagger 1969)
R&D Discussion

• Implementation of Algorithms
  - R&D topics
    • FPGA, Associative Memory approaches
  • Are there any critical hardware elements to be evaluated?
    - Optical Links, connectivity options
    - FPGA
    - µTCA evaluation cards
Phase 1 Discussion

- **What could we do in Phase 1 from pixels?**
  - Opportunity to test technologies and ideas
  - Personal opinion: if it is to happen, we must make a strong case to do this and relatively soon
  - Ideas to investigate
    - Use pixel occupancy to narrow z vertex in matching
      - (eta, phi) from calorimeter allows look up of z in pixel (eta, phi, z) map
      - Does it work at 2E34? 1E35?
      - What resolution do we need?
    - Can we get the data out at 40 MHz?
      - Maybe just readout at L1A and use as L2 in HLT
    - Can we get the data to the muon, calorimeter triggers?
Phase 2 R&D Plan

• **Cornell (Phase 2 R&D)**
  - Personnel: A. Ryd, L. Fields (postdoc)
  - Working also on tracker trigger primitives
  - Investigation of electron matching
  - Interest also in tau triggers
  - Concentrate on simulations

• **Texas A&M (Phase 2 R&D)**
  - Personnel: T. Kamon, M. Weinberger (postdoc)
  - Simulation studies at tracker-calorimeter interface
  - Tau triggers using TK trigger primitives
  - Interest also in pixel trigger
Phase 2 R&D Plan

• **Florida (Phase 2 R&D)**
  - Personnel: D. Acosta, I. Furic, M. Fisher (grad)
  - Forward track finder & Muon matching to CSC
  - Simulation of muon
  - Studies of possible architectures
  - Studies of technology for algorithms FPGA vs AM++

• **FNAL/Vanderbilt (Phase 2 R&D)**
  - Personnel: H. Cheung, T. Liu, E. Brownson (postdoc)
  - Development of simulation framework
  - Forward Track finding with disk geometry
  - Interest in track finding algorithms
  - Possible interest in pixel trigger
Phase 1+2 R&D Plan

• Nebraska (Phase 1 +2 R&D)
  - Personnel: I. Kravchenko, TBA (postdoc)
  - Pixel triggering in phase 1 and 2
    • Z vertex
    • Eta, phi, z occupancy
  - Simulation studies

• Rice (Phase 1 +2 R&D)
  - Personnel: K. Ecklund, V. Cuplov (postdoc), undergrad
  - Pixel triggering
    • Optical links & on-off transfer, architecture options
  - Simulation studies
    • Couple to Florida for muon matching Phase 1 ; A&M for tau...
  - TK Trigger architecture (Phase 2 R&D)