

# Tungsten and Scintillator HCAL test beam plans for 2011

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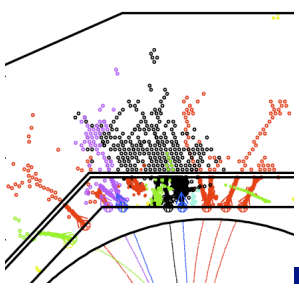
**CALICE Collaboration Meeting, University Hassan II,  
Casablanca, September 22-24, 2010**



# Intro

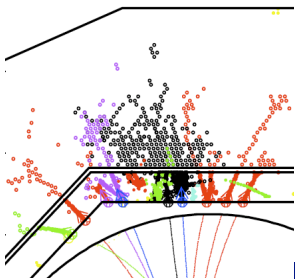
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- Plans around the tungsten structure
  - Physics goal: investigate suitability of W for hadron calorimetry
  - Test G4 simulation, including timing
  - Start with 1st generation AHCAL instrumentation
  - Add / replace by gaseous and time resolving components as they become available
  - Following discussions between **K. Elsener, E. Garutti, W. Klempt, L. Linssen, D. Schlatter, F. S.**
- 2nd generation scintillator HCAL
  - few HBUs in 2011
  - full slab or even layer (with cosmics)
  - small stack (à la minical, with DESY electrons)
  - probe layer in tungsten stack: most challenging, most interesting



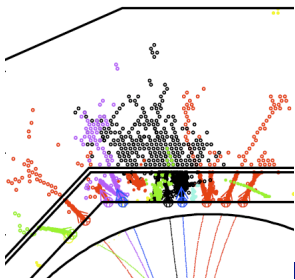
# Tungsten HCAL Plans

- General aim of the WHCAL test-beams:
  - Input to Geant4, study PFA performance (event overlays etc): nothing special is needed to prepare data-taking in 2011
  - Learn as much as possible about the time structure
- WHCAL with existing (38) scintillator planes
  - 40 absorber layers
  - scintillators with the present electronics
- Beams:
  - In addition to hadrons, both muons and electrons are required
  - A wide muon beam, eventually hitting all cells, is preferred
  - Electron energies: min. 5 energy points 5-50 GeV
  - Pion energies: As high as possible, if possible also with some overlap with PS data; 10 points (with emphasis on overlap region within Geant4 modeling)
    - 8(?) 10 12 15 18 20 25 35 50 80 120 200 300 GeV
  - Polarities: both (low energy, not all points) - if no part separation possible, take only neg. polarity.
  - Protons in addition to pions (you get it within the same runs from double-Cerenkov; also kaons if possible)



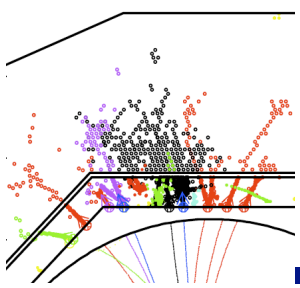
# Tungsten HCAL Plans, cont'ed

- Geometrical scans
  - In general, no X,Y scan in 2011; maybe one step to another area, with electron beam
  - Trigger surface: convenient to use the entire beam, cut with chambers (10x10 cm<sup>2</sup> was ok in the past - wire chambers + Cerenkov cover same areas, maybe adapt and reduce trigger scintillator sizes)
  - No angular scan in 2011
- How much data and how many points:
  - minimum 250'000 per point (first take priority points, fill the gaps later if still time available)



# W Plans, to be discussed

- Choice of the SPS beam:
  - avoid H6; ask for 300 GeV pions, try also – if possible - to find a CALICE or even LC detector "home area" for the longer term future
- Preferred 2011 periods: one in spring, and one in the autumn
- Questions/options for autumn 2011:
  - ECAL in front: Check with collaborators - tbd. at/after Casablanca
  - tail catcher: in use first half 2011 at Fermilab, later scint. planes available, most likely not the steel structure (will be important at 300 GeV !)



# W Plans, add-ons

- Detectors from MPI:
  - Wait for PS tests, compare to simulations
  - Increase area of detector? Can we think of additional hardware? Order picoscopes - more than doubling PS effort is not realistic
  - Ready to take data in spring 2011 (cf .PS outcome), repeat in fall
- Alternative detectors:
  - insert reserve time in test-beam request
- Micromegas LAPP
  - some layers coming up
- MGGRPCs Bologna
  - wait and see, but hope for next year ...
- Scintillators with new electronics,
  - 2 layers DESY -- ambitious but not excluded...
- Who, when and how many layers:
  - Casablanca meeting should provide more information