LLS + Lepton Working Group

Young-Kee Kim, 6/1/01
CDF Collab. Meeting

- LLS (Low Level Subjects) group
  - Initiated by Avi Yagil, Nigel Lockyer, Simona Rolli, YKK in November 2000.
  - Initially
    - Work closely with a small group of students and postdocs who are relatively new to CDF.
    - Help them understand the basic detector configuration and the parameters for calorimeter, tracking, electrons, muons
    - Educate each other about Run II software (simulation and reconstruction)

      → help the offline group & the operation
      - give feedback to them when data or simulation variables do not make sense
      - recruit people to be part of simulation/reconstruction group
      - Level-3 and production output comparison
      - exercise data handling
    - The group got bigger. (over 50 people in the mailing list)
    - Meeting : Every Tuesday 11 – 12:30 in Theater
  - Top/EWK conveners (Pierre Savard & Willis Sakumoto) planned to organize a lepton working group under their physics group.

- LLS + Lepton Working group under Top/EWK/Exotic Physics Group
  - Tuesday, 11am, Theater
  - Goals :
    - Developing algorithms
    - Efficiencies
    - Detector Acceptances
    - Trigger Efficiencies
    - Electron energy, Muon momentum calibration
  - Top/EWK Physics goals for Summer 2002 Conferences (Pierre's talk)
    - $\gamma,Z \rightarrow e^+e^-, \mu^+\mu^-$ (Drell-Yan Production)
      - Differential cross section ($ds/dM_{l^+l^-}$) at high mass
      - Forward-Backward Asymmetry at high mass
    - $W \rightarrow e\nu, \mu\nu$
      - Charge Asymmetry
    - $\sigma(W) / \sigma(Z)$

Activities

- Calorimeter
  - Toni Munar, Susana Cabrera, Simona Rolli, Rick Tesarek, Dmitri Tsybychev, Pierre Savard, …
- Tracking
  - Anadi Canepa, Monica D'Ohofrio, Eiko Yu, Nigel Lockyer, Bill Orejudos, …
- Electrons
  - Central :
    - Greg Veramendi, Guilia Manca, Heater Gerberich, MooHyun Ahn, Steve Vejcik, Michael Riverline, HungChung Fang, Laurent Vacavant, Nancy Lai, Bob Wagner, Avi Yagil, YKK, …
  - Plug :
    - Erik Brubaker, David Goldstein,
- Muons
  - Anyes Taffard, Auke-Pieter Colijn, Tracey Pratt, Pasha Murat, Michael Schmitt, …
- Level-1 triggers
  - Calorimeter
    - Toni Munar, Beate Heinemann, Carla Grosso-Pilcher, …
  - XFT
    - Evelyn Thomson, Erik Brubaker, Vladimir Rekovic, …
- Level-3 filters
  - Electrons, photons
    - Giulia Manca, Greg Veramendi
- Level-3 vs. Production
  - Calorimeter : Andrew Kovalev
  - Tracks : Guilia Manca
  - Electrons : Erik Brubaker

Activities (cont.)

- Monte Carlo simulation
  - Goals :
    - For every frozen release, simulate/reconstruct 500~1000 events using "standard" simulation and reconstruction.
    - Validate them and give feedback to the simulation group.
    - The samples are located in the top area and are for general use.
  - Datasets :
    - Single particles (e,μ,π) : Erik Brubaker
    - Z → ee, μμ : Joel Goldstein
    - W → eν, μν : Greg Veramendi
    - tt → dilepton : Nancy Lai
    - tt → lepton + jets : Erik Brubaker
    - BB → dilepton + X: Guilia Manca
    - B → J/φ + X : Eiko Yu

Activities (cont.)

- Interactions with other groups.
  - Some serve as liaison between our group and the reconstruction / simulation group. Some started to get involved in the offline.
    - Muons : Auke-Pieter Colijn, Tracey Pratt, Anyes Taffard
    - Plug EM clustering algorithm : David Goldstein
    - Calorimeter simulation validation/tuning : Erik Brubaker
  - Very good feedback from the reconstruction/simulation experts
    - Pierre Savard, Benn Tannenbaum, Michael Riverline, Bob Wagner for calorimeter and electrons
    - Michael Schmitt, Ken Bloom for muons
    - Elena Gerchtein, Olga Lobban, Manfred Paulini for Simulation
  - A lot of help from the Level-1 trigger group
    - Calorimeter : Carla Grosso-Pilcher
    - XFT : Evelyn Thomson
  - Sharing with B group
    - Photon conversion sample : Hung-Chung Fang, Laurent Vacavant
  - Connection with ObjectMon group

Triggers Very Near Future

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- Most of Top/EWK physics analyses rely on high Pt electrons and muons (Et, Pt > 20-25 GeV).
- Until we cut on Level-2, we can handle with Level-1 and Level-3 triggers only.
  - Level-1
    - Electrons : EM cluster Et > ~15 GeV + Pt > ~10 GeV
    - Muons : Muon high Pt stub + Pt > ~10 GeV
    - (thresholds depend on instantaneous luminosity)