
# PerfIDia: Status Report

What it is?

What we want?

What is it going to be?

*Simona Rolli*

# Automation of ID/SF

- What's the purpose?
  - To have common code for the analyses sharing the same ID/reco/trigger cuts
    - Provide quickly the same SF to apply to MC
  - Check data stability
    - Run the common code from one place as soon as the ntuples are ready
  - Most of this is done already
    - Several groups/individuals

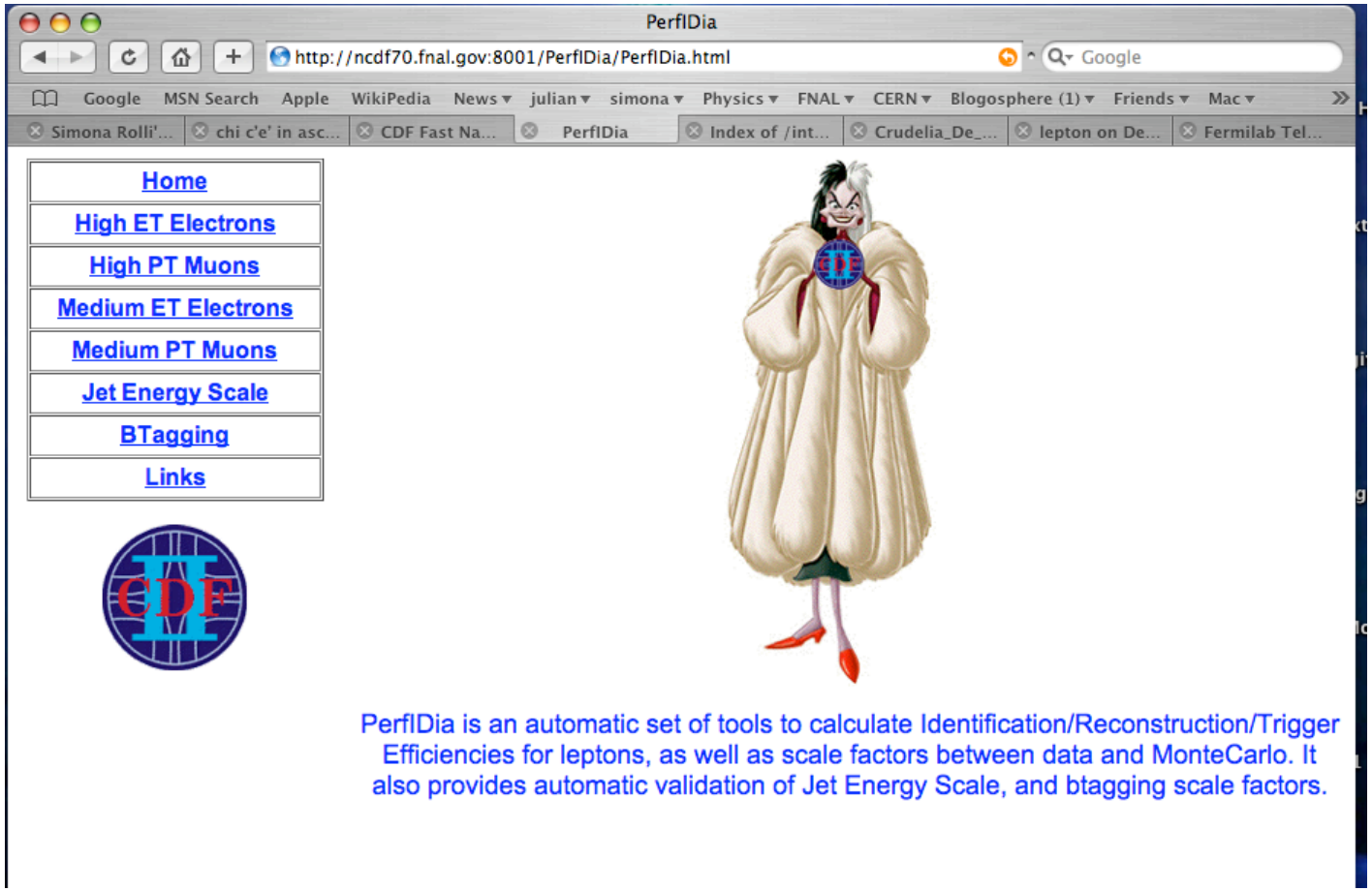
# Automation of ID/SF - caveats

- Not all the analysis share the same ID/SF
  - Especially searches are “tuning” cuts to get the best acceptance/efficiency
    - WZ example
  - It is important to keep diversity
    - Not one size fits all
  - Development/refinement of *new* cuts will still happen!
    - Driven by physics analysis
    - eventually approved by JP

# Initial Development

- Automatic tool to check data stability
  - All code in one common place
- TopNt and StNtuple produced shortly after Production data is available: target 4-6 weeks
- The ID code will be launched to validate the new ntuples and determine the various efficiencies and SF
- Output will be posted as plots and tables onto web pages and e-mails will be sent to relevant experts to sign off
- Joint Physics group will do the final sign off

# Status




http://ncdf70.fnal.gov:8001/PerfIDia/PerfIDia.html
PRELIMINARY!

# Status

- Current validation of the new high PT leptons samples:
  - High Et Electron ID (D. Hare, Eva H. T.Spreitzer)
    - Code put in CVS (ElectronUser)
  - High Et Electron Trigger Eff ( BoYoung Han)
    - Code testing, will go into CVS soon
  - High PT Muons (Illinois/Slovakia)
    - Code already in CVS (MuonUser)
  - Jet Jet Balancing
    - Code already in CVS (JESstudies)

# Status: Electrons ID

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- Medium ET Electrons
- Medium PT Muons
- Jet Energy Scale
- BTagging
- Links

- Documentation:
  - Web Page
  - CDF Note 8274, June 1st, 2006
  - CDF Note 8614, November 27, 2006
  - Joint Physics Meeting Blessing, November 17, 2006
- Code:
  - Instructions on how to run the code
- Results:
  - Post ShutDown data ( June 2006 to September 2006): Runs 217990 to 222426 (MC sample zewkcd):
    - Mass distributions with comparisons between data and MC
    - Efficiencies and Scale Factors for data and MC (file not formatted!)
  - bhel0i Pre ShutDown data (September 2005 to June 2006): Runs 203819 to 212133: (MC sample zewkcd)
    - Mass distributions with comparisons between data and MC
    - Efficiencies and Scale Factors for data and MC (file not formatted!)
  - bhel0h (December 2004 to September 2005): Runs 190697 to 203799 (MC sample zewkcd)
    - Mass distributions with comparisons between data and MC
    - Efficiencies and Scale Factors for data and MC (file not formatted!)
  - bhel0d (2002 to August 2004) : Runs 138425 to 186598 (MC sample zewkcd)
    - Mass distributions with comparisons between data and MC
    - Efficiencies and Scale Factors for data and MC (file not formatted!)

How to run the electron efficiency code on TopNtuple
The code runs in two steps:

- A standalone executable runs on TopNtuple:
  - 1.) main_lepid: basically reads in the command line arguments and then runs ana_lepid accordingly;
  - 2.) ana_lepid: does the electron selection, makes mass plots, and outputs raw efficiency numbers and N-1 efficiencies.

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# Status: Electron ID

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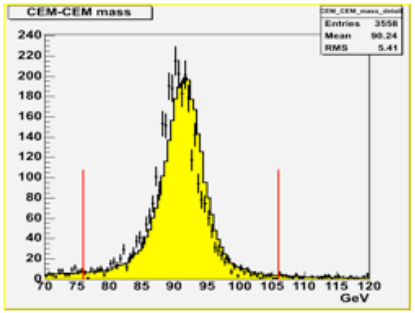
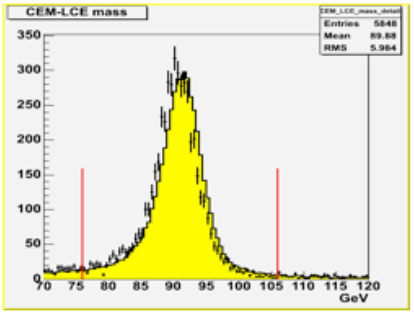
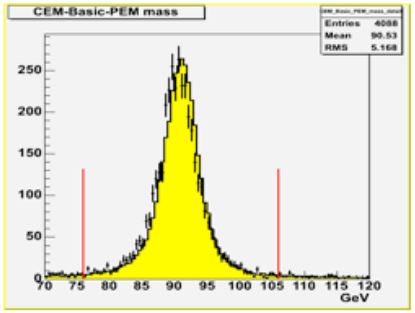
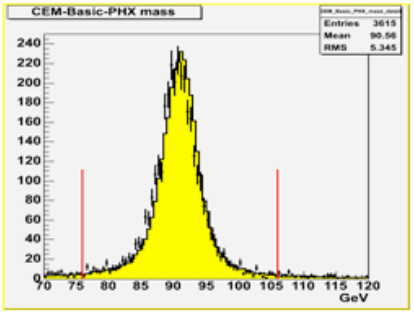
## Post Shut Down Data (Runs 217990 to 222426, dataset bhel0i)





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# Status: Electrons ID

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CEM Z data counts,

| | 66-116 | 71-111 | 76-106 | 81-101 | 86-96 |
|---|---|---|---|---|---|
| CEM-CEM | 6616 | 6492 | 6322 | 6084 | 5194 |
| CEM-nisoCEM | 6886 | 6740 | 6555 | 6294 | 5352 |
| CEM-looseCEM | 7686 | 7541 | 7342 | 7047 | 6025 |
| CEM-nisolooseCEM | 8004 | 7831 | 7602 | 7277 | 6191 |
| CEM-LCE | 8570 | 8359 | 8098 | 7734 | 6532 |

| | | | | | |
|---|---|---|---|---|---|
| CEM-ssCEM | 10 | 10 | 10 | 10 | 8 |
| CEM-ssnisoCEM | 12 | 12 | 12 | 11 | 8 |
| CEM-sslooseCEM | 18 | 17 | 17 | 16 | 12 |
| CEM-ssnisolooseCEM | 33 | 29 | 26 | 20 | 11 |
| CEM-ssnisolooseCEM | 33 | 29 | 26 | 20 | 11 |
| CEM-ssLCE | 156 | 132 | 113 | 88 | 56 |

CEM Z mc counts,

| | 66-116 | 71-111 | 76-106 | 81-101 | 86-96 |
|---|---|---|---|---|---|
| CEM-CEM | 139242 | 136898 | 133598 | | |

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# Status: Muons

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- Documentation:
  - Web Page
  - CDF Note 8262, June 1st, 2006
  - Post Shutdown data and efficiencies for Winter 2007 (Lepton Group, November 29 2006)
- Code:
  - Instructions on how to run the code
- Results ( PRELIMINARY :
  - Post Shut Down Data ( June 2006 to September 2006): Runs 217990 to 222426
    - Root file of distributions
    - Efficiencies TeX file
  - Pre Shut Down Data (September 2005 to June 2006): Runs 203819 to 212133
    - Root file of distributions
    - Efficiencies TeX file
  - bhmu0h (December 2004 to September 2005): Runs 190697 to 203799
    - Root file of distributions
    - Efficiencies TeX file
  - bhmu0d bhel0d (2002 to August 2004) : Runs 138425 to 186598
    - Root file of distributions
    - Efficiencies TeX file

How to run the muon efficiency code on TopNtuple
The code lives in CVS (from the head of the repository) under /MuonUser/macros/MuonEffTopNt/.
setup a new test release:
source ~cdfsoft/cdf2.cshrc; setup cdfsoft2 6.1.4; newrel -t 6.1.4 newrel; cd newrel;
add from the head MuonUser and TopMods
addpkg -h MuonUser ; addpkg -h TopMods;
go to the area in MuonUser/macros/MuonEffTopNt/ which will be your working area.
cd MuonUser/macros/MuonEffTopNt/ ;

Display a menu for "http://ncdf70.fnal.gov:8001/PerfIDia/HighMuons.html"

# Status

- Right now I'm still collecting all the code, testing it and fixing minor details (like outputs to file instead of screen, talk-to parameters etc)
- The code is different for each task
  - As expected
  - Should try to combine?
  - How about TopNt vs STNtuple?

# Near Future

- New data available in early January
  - Should be ready to run the code in semi-automatic mode (ie one person launching it) for leptons e/$\mu$ and JES
  - Develop scripts to automatically check out code, compile/link and run
    - GRL ?
      - Probably ready on the time scale of ntuples?
    - Finalized datasets

# Management structure

- Avoid multiple meetings:
  - Leptons:
    - PerfIDia manager will attend the lepton group meeting (new convener) and will make sure that all the official code is in CVS
      - Development of new cuts/algs will proceed in parallel to data validation using official perfID cuts
  - JES
    - Code already in CVS, StNtuple
  - btagging
    - Next step
  - Reports at the JP meeting
    - PerfIDia code will have to be updated at the same time of blessing of new ID/SF
    - Timely reports on data stability checks etc..

# Timescale

- In order of priority (from Doug)
  - 1) high $P_T$ e/$\mu$ trigger/reco/ID efficiencies and MC scale factors
  - 2) JES $\gamma$/jet validation and dijet balancing
  - 3) TopNt and StNtuple validation plots
  - 4) btag mistag rates, eff, and SF
  - 5) Taus? Photons? Med/Low $P_T$ lepton trigger/reco/id ?

# Timescale (con't)

- Leptons e/$\mu$ and JES are ready for next chunk of production data (01 Jan 2007)
  - PerfIDia code ready to run on ntuples
  - Some validation plots available
- Iterations w/ experts to address problems
  - Adding btag if possible for next chunk of data (Feb 15 2007)
- Done with items 1-4 for the next chunk of data (Apr 2007)
- Cruising altitude reached until next shutdown!