Current Efforts

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Outreach Efforts

- DZero Public Relations
  - Result of the Week: plain-English physics summaries in FNAL Today
  - Press release coordination
  - General PR
- DZero tours and talks for visiting schools & groups
- Fermilab tours for visiting schools & groups
- CMS "local" tours
  - Remote control room / LPC activities

DZero Efforts

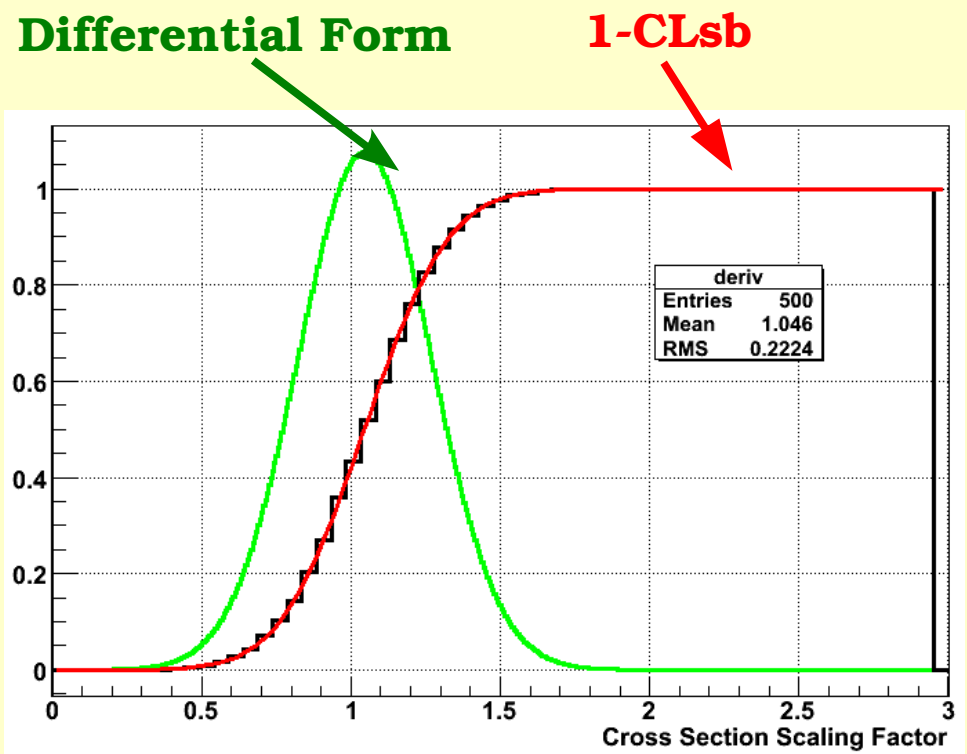
- Statistical Physics support
  - Creation of a robust, advanced statistical analysis package
  - Provide tools for limit setting, background CL estimation, etc
- DZero TEVNPHWG representative
  - Evaluating combined CDF/DZero Higgs limits
- Diboson/Higgs Search
  - Search for WW/WZ->lvbb
  - Evaluation of current Higgs search techniques *in situ*
- Editorial board member

Statistical Physics

- Problem: Tevatron new-phenomena searches are somewhat unique in HEP
  - Very small signals with large backgrounds (Poisson + Gaussian)
  - Systematic fluctuations are often larger than the signal
  - Searches carried out in ~20 channels
  - Tools inherited from LEP insufficient, but a good start
- Solution: COnfidence Level LImit Evaluator (collie package in d0cvs)
  - Provides tools for evaluating confidence levels, cross section limits (one or two sided), 3/5-sigma luminosity evaluations
  - Robust treatment of multichannel searches with many correlated systematic sources
  - Modern treatment for problem of marginalization
  - Heavily used in DZero Higgs & New Phenomena groups

WZ->lvbb

- Goal: study a calibration "Higgs" system with ~4.5 times larger cross section
  - Necessary for studying statistical scenarios, multivariable analysis techniques, & invariant mass resolution amongst others
  - Ongoing work with a graduate student…nearly done
  - First measurement of WW/WZ with jets in final state at the Tevatron

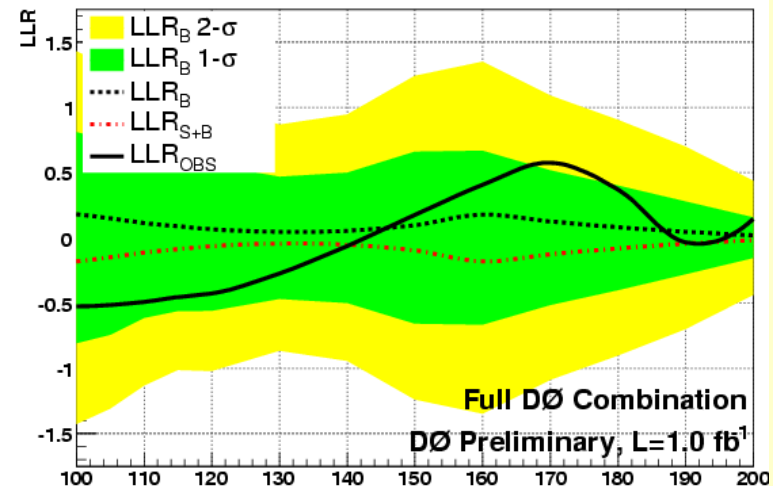


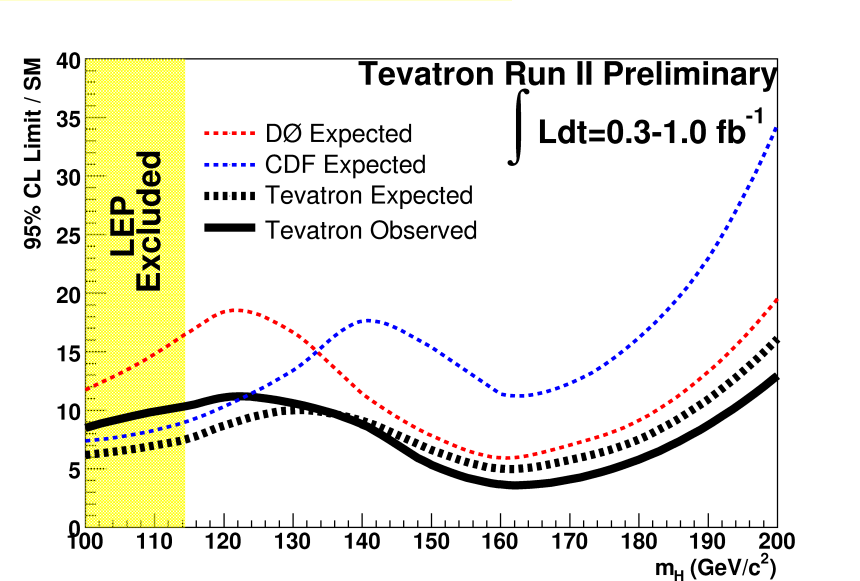
- A "new" technique for cross section measurement
  - Scan cross section in Frequentist framework to find compatibility with signal+bkgd hypothesis
  - CLsb = Confidence Level for signal+background
  - Differential form gives posterior probability density via effective analytic prior estimation

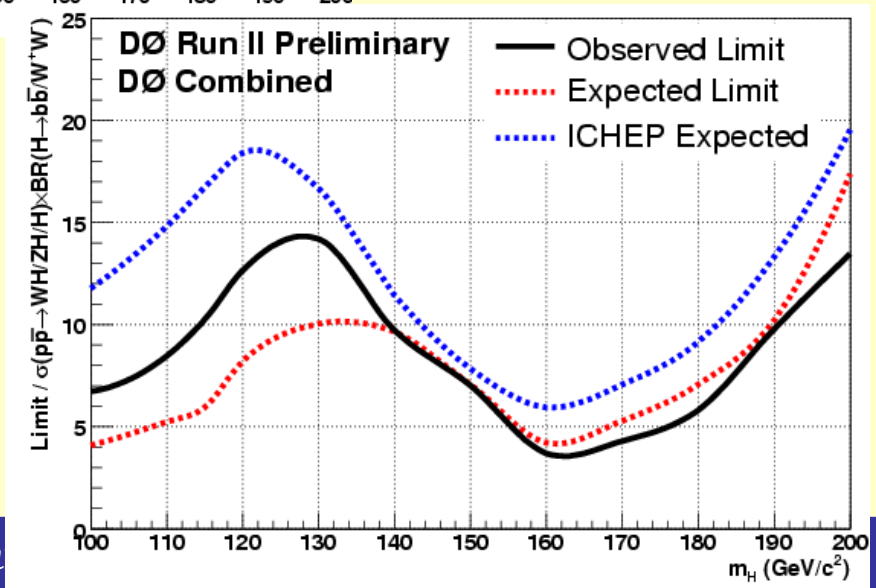
Higgs/TEVNPHWG

✗ Perform DZero & Dzero/CDF Higgs search channel combinations

You've probably seen several of these plots floating around







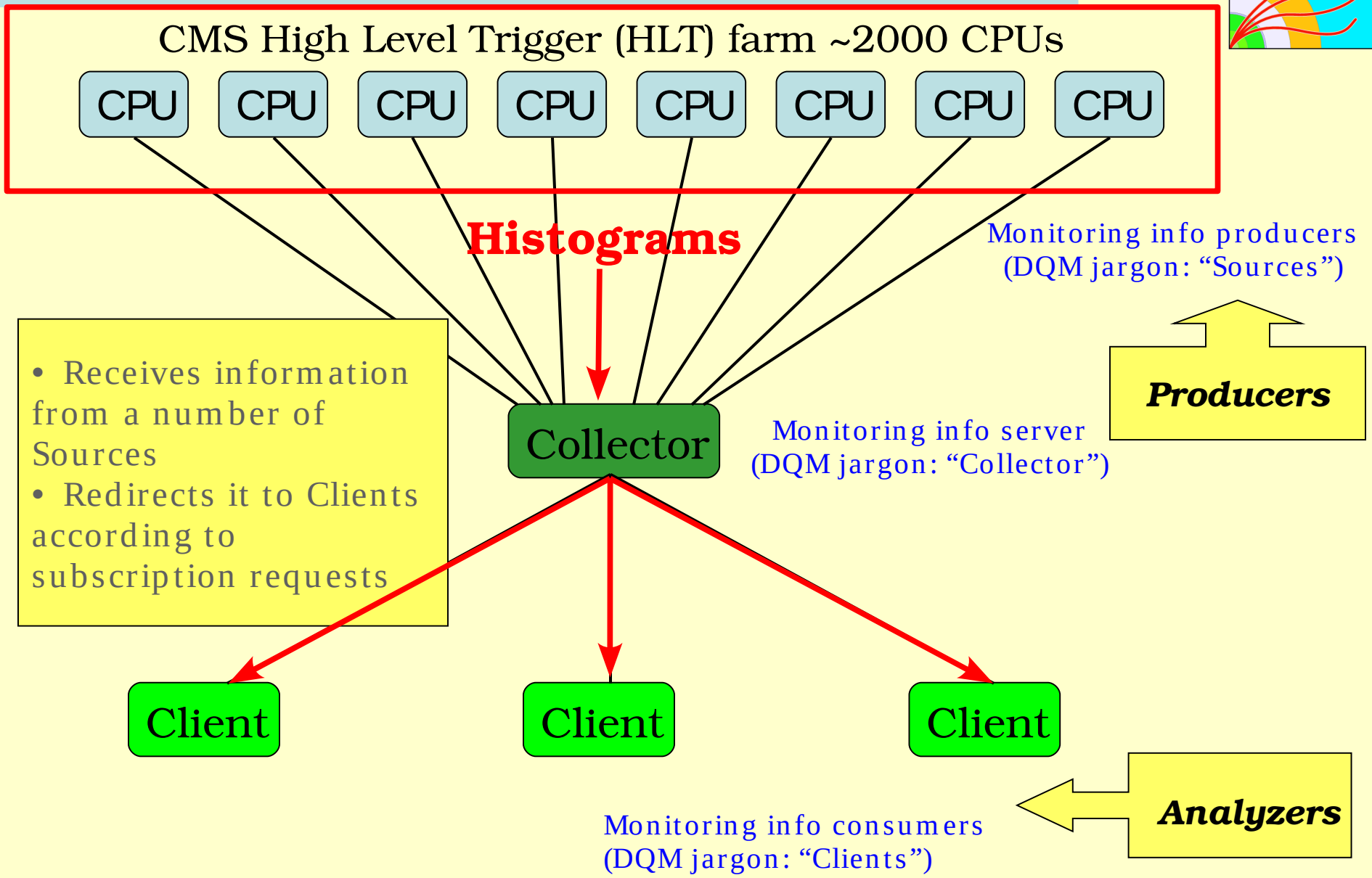
DZero Papers

- Papers in the final states
  - 400 pb^{-1} combined Higgs results: to be submitted this week
  - 1000 pb^{-1} combined Higgs results: to be submitted this year
  - WW/WZ measurement: publication spring '08
  - Tevatron Higgs combined results: sent to arXiv
  - Long list of conference notes in Higgs & New Phenomena groups

CMS Efforts

- CMS Hcal Data Quality Monitoring group leader
  - Online/Offline/Trigger/Physics monitoring efforts
  - Software implementation at “L3 farm”, DAQ, SAM levels
- CMS Hcal DQ board chair
  - Decision forming advisory council
- Commissioning of CMS Hcal sub-detectors
  - Ongoing work at CERN
- DQM Efforts in CMS Global Runs
  - Global runs are the integration effort for the readout + DAQ
  - DQM aspects are being pushed heavily
  - Ongoing at the end of every month

CMS Online DQ Monitoring



CMS Hcal DQM

- Monitoring from Electronics to Physics
  - From photodetectors (lowest) to Jet/MET distributions (highest)
  - Design of flexible software infrastructure to accommodate all levels in online environment
- Offline DQ decisions
  - Run "post-mortem"
- DQ board
  - Charged with defining: alarm conditions, online quality criteria, offline quality criteria, hardware/physics balance