Statistical Methods for LHC

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Statistical Methods for LHC

Commercial Break

Previous Activities (CDF)

Present Activities

Systematics

Future Activities

CDF Statistics Committe

http://www-cdf.fnal.gov/physics/statistics/statistics_home.html

2 modes of operation:

- write recommendations, etc.
- answer questions

- plus List of Links to Statistics of Web, books, etc.

General advice on:

Bayes vs. Frequentism

Limits

Multivariate Methods (see also Run II AAG Pushpa Bhat)

Blind Analyses

Goodness of Fit, Hypothesis Testing

Pulls $\left(x_{fit} - x_{meas}\right) / \sqrt{\sigma^2_{meas} - \sigma^2_{fit}}$

What is Systematics?

Likelihoods

Significance

Ordering Rules and Neyman Construction

Ensembes (coming soon)

More Specific Items

Unbinned L_{max} $\neq$ goodness of fit

Likelihood ratio for Poisson with small μ

$\sim \frac{1}{2} \chi^2$?

Coverage for Poisson Recipes

Comparing 2 Hypothesis

Optimising Searches

Systematics in Limits

Questions

ε = 150/150. What is error?

ε >1?

Exclusion of outliers?

Error on ratio of Poisson Numbers

Systematics on peak Parameters from Background Uncertainties

Systematics from Result varying with Cut?

Unlikely Observations via Probability Density or Tail Area?

What have I been doing here?

Interact with : Fred James
ATLAS
CMS
LHC-b
Maria Gracia Pia

The problem: Systematics

Conclusions

Interesting Statistical Issues

Devise recommended procedures for systematics

Provide Computer Code