

Physics Simulation and
Modelling
Project Review

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PATRIOT

- Matched Datasets
- TeV2/LHC Comparisons

RESEARCH

- Matching Methods
- Pythia development
- Pythia tunes
- Analysis Methods (BARD)
- etc

RESOURCE

- Top Mass uncertainties
- Monte Carlo questions
- etc

PATRIOT

- Transitioned to Condor job submission
 - Local Grid jobs
 - OSG still hit-and-miss
 - Consulted with Burt Holzman
 - Haven't used Nikolay K. tools
 - More requests!

RESEARCH

Physics Tools

PYTHIA

- v6.402

- cvs/svn @ hepforge.cedar.ac.uk
- manual publ. in JHEP (500+pp)

Monthly meetings:
International calls?

BARD

- automated interpretation of anomalies
- interfaced to CDF (via Knuteson)

Small local
cluster?

HepForge > SVN / CVS > CVS - CEDAR - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://hepforge.cedar.ac.uk/hf/vc/cvs/pythia6/?only_with_tag=MAIN Go

Fermi Linux Fermilab FermiLinux Linux Distros

Fermilab Webmail HepForge > SVN / CVS > CVS ...



CEDAR HEPDATA JETWEB HEPFORGE HEPML

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 - ◊ CVS
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HepForge version control

[pythia6] Project Root:

Current tag: MAIN
Files shown: 0

File	Rev.	Age	Author	Last log entry
pythia6/				

Show files using tag:

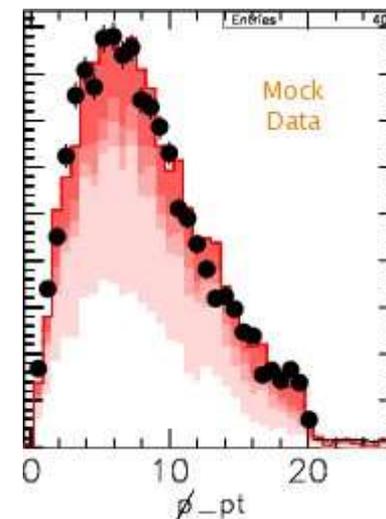
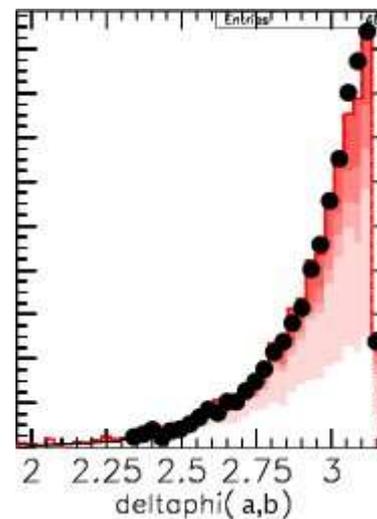
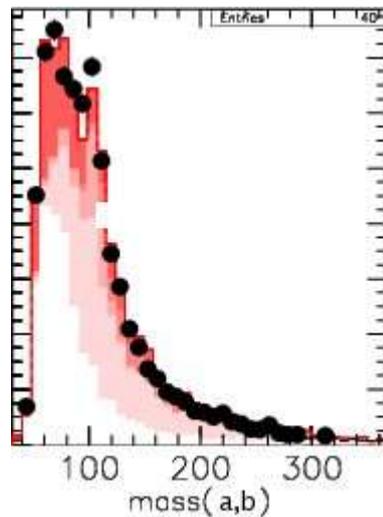
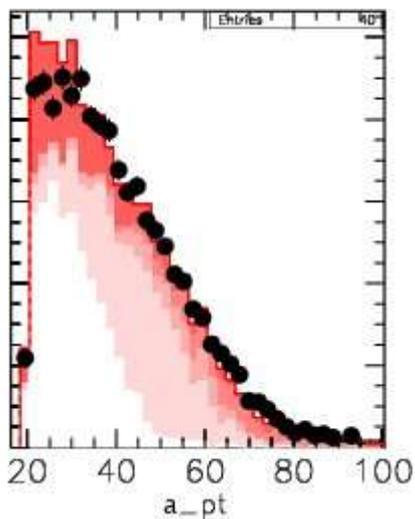
hepforge@cedar.ac.uk
Powered by ViewCVS 1.0-dev



Done

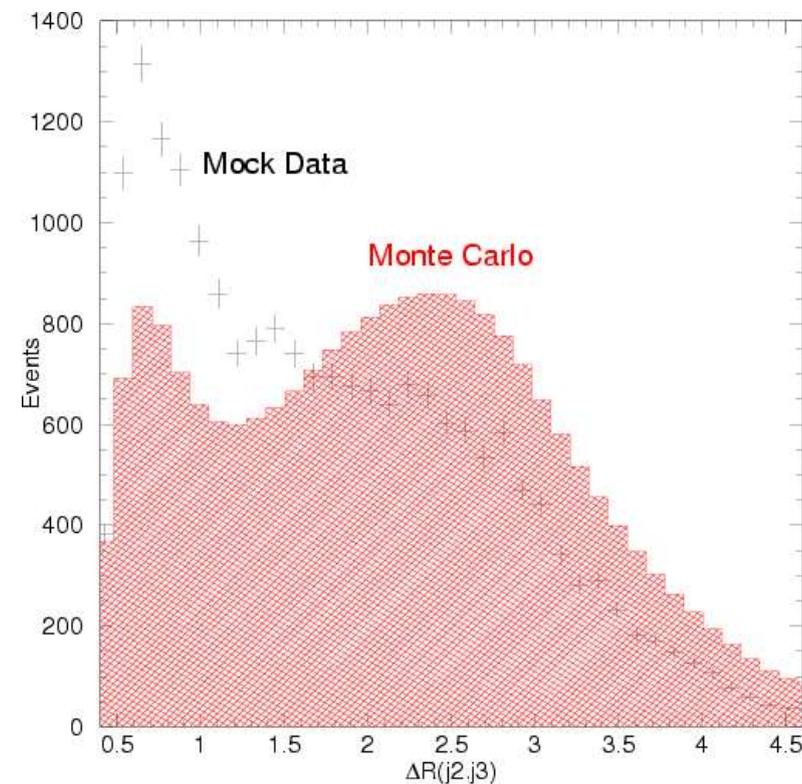
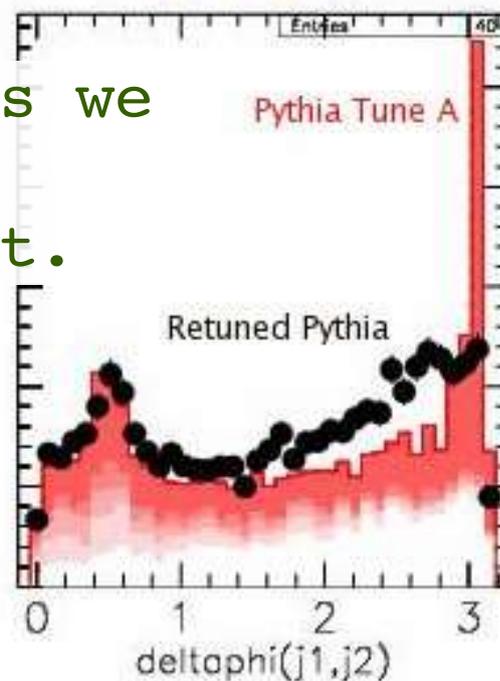
Taking advantage of existing resources to facilitate code management.

Automatic comparison of many distributions:



Physics effects we identified and corrected first.

$e^- 2j \cancel{\phi}$



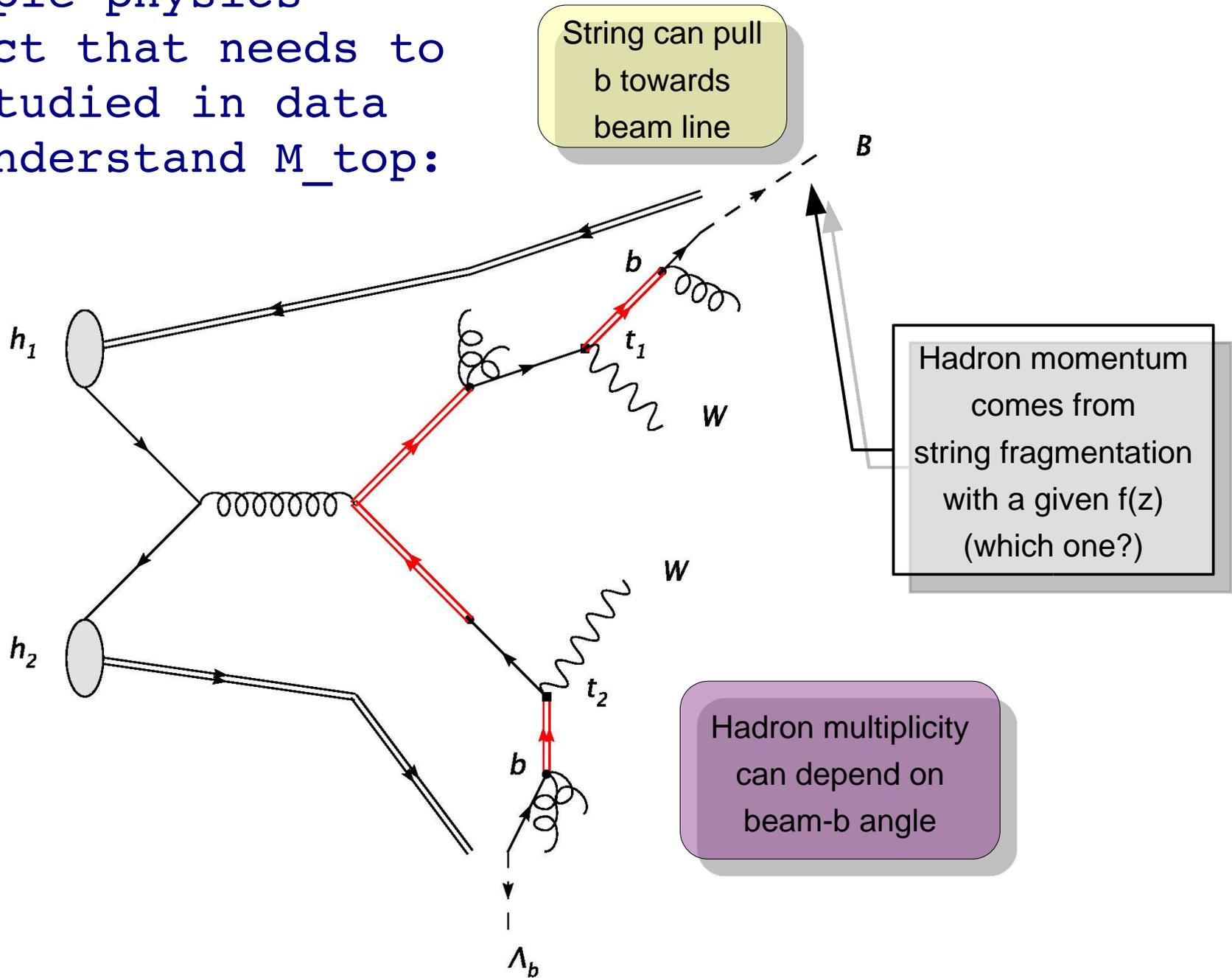
RESOURCE

Typical Questions:

- How do I resurrect my Run I analysis?
- Why do I get different results with Pythia 6.X?
 - Does this Tune make sense?
- Why does distribution 234 of 12542 look wrong?
- How often should a quark/gluon fake a single pion?
 - How do we understand M_{top} to 1 GeV?

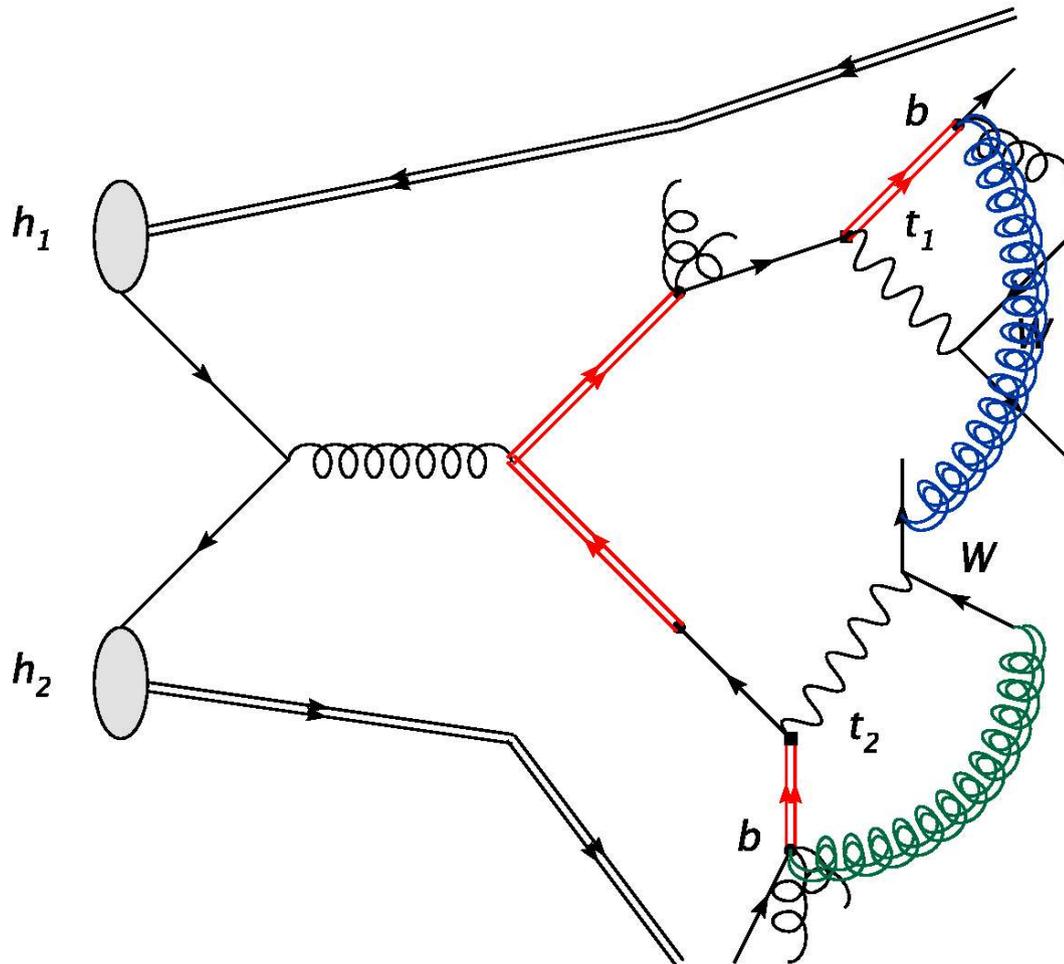
Answers have a direct impact on value of our science program.

Example physics effect that needs to be studied in data to understand M_{top} :



After talk to CDF/D0, I was asked to make a prioritized list for the experiments to study:

Color Recombinations affect fragmentation, momentum of reconstructed objects



Leading Systematic in W mass @ LEP
 ~ 100 MeV

Magnitude of effect in hadronic environment not well known

Need to implement effects in MC tools.

CONCLUSIONS

- Patriot project is not separable from Research or Resource
- The project is not physics or computing alone
- Lack of people trained to do this
- Want to pursue opportunities to add a physicist
 - postdoctoral level?
 - staff level?
 - in conjunction with theory/lattice/astro?
 - external funding (LHC Theory Initiative)?