

CMS Tutorial: HLT, Generator Interface & HepMC inclusive b analysis: Unfolding

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Outline

- ☐ HLT tutorial
- ☐ Generator Interface
- ☐ HepMC

- ☐ Unfolding in “inclusive b”

[TWiki](#) > [CMS Web](#) >
[CMS Offline Workbook](#)
[CMS Offline SW Guide](#)
[Reference Manual](#)

Tutorial past

CMS weekly meeting
Nov.07 2008

<http://indico.ihep.ac.cn/getFile.py/access?contribId=0&sessionId=0&resId=0&materialId=slides&confId=548>

- ☐ CMSSW EDM, Data tiers P.38,39 P.44
- ☐ PYTHON P.34-37
- ☐ DBS P.41-42
- ☐ Crab P.40
- ☐ PAT P.44-45
- ☐ RooStats P.46

HLT

- [TWiki](#) > [CMS Web](#) > [WorkBook](#) > WorkBookHLTTutorial
<https://twiki.cern.ch/twiki/bin/view/CMS/WorkBookHLTTutorial>
HLTrigger/HLTAnalyzers : [HLTAnalyzers](#)
- Use the [ConfDB web browser](#) to browse the content of the configuration database and inspect available HLT menus.
<http://cms-project-confdb-hltdev.web.cern.ch/cms-project-confdb-hltdev/browser/>
- HLT paths: HLT_2E30_cff.py
- L1 Global Trigger: Available Trigger Menus
- Trigger Tables

Generator Tools

->Generator Interface & HepMC

□ Generator Interface

goal: a framework evt can generated, converted to LHC MC evt format(= HepMC), filtered and output into a rootuple.

1. direct Pythia: HEPEVT 2 HepMC
2. MC File Reader
3. Particle Guns
4. Cosmic Muons

□ HepPDT: particle Data Table

□ HepMC

- -particles: momentum, flow, polarization, id and status inform
- -vertices: position, id, and (spin density matrix) weight infom
- -event: process id, evt number, weight, and random numner state inform

- 7 core class:

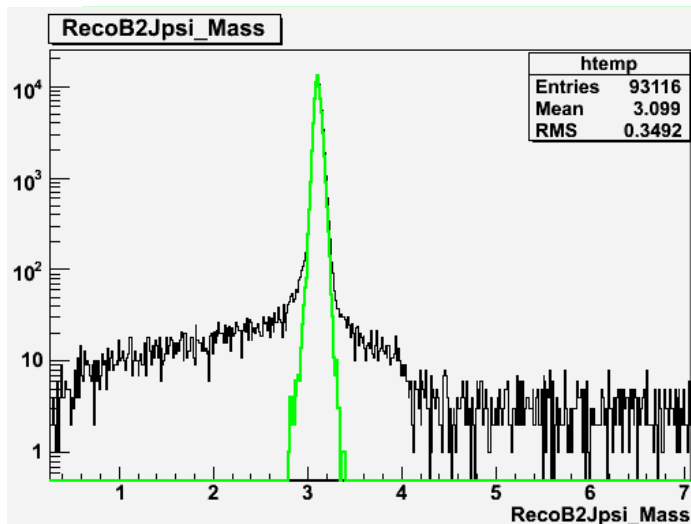
GenEvent, GenVertex, Genparticle, Flow, Polarization, WeightContainer, IO_BaseClass

- utility classes: IO_HEPWVT, IO_GenEvent, HEPEVT_Wrapper, PythiaWrapper...

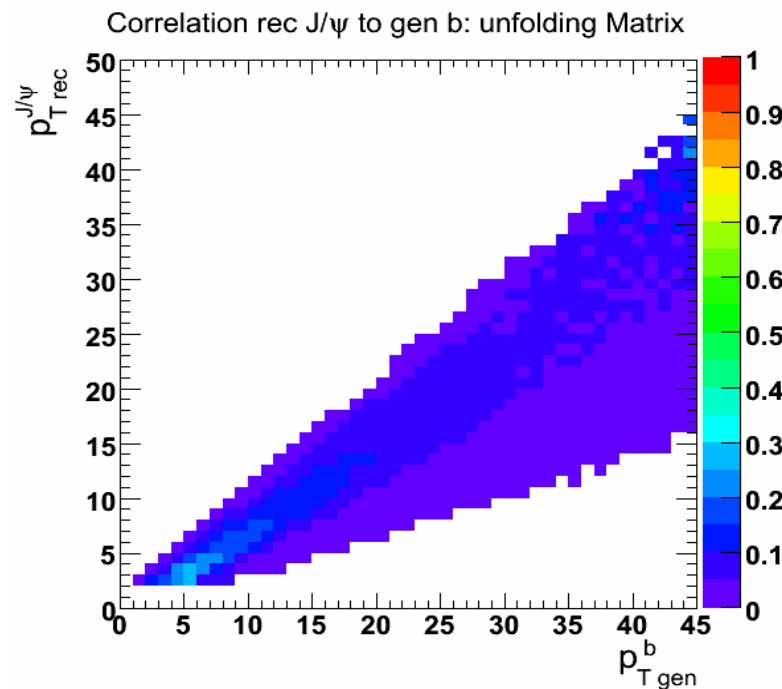
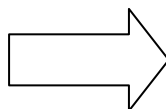
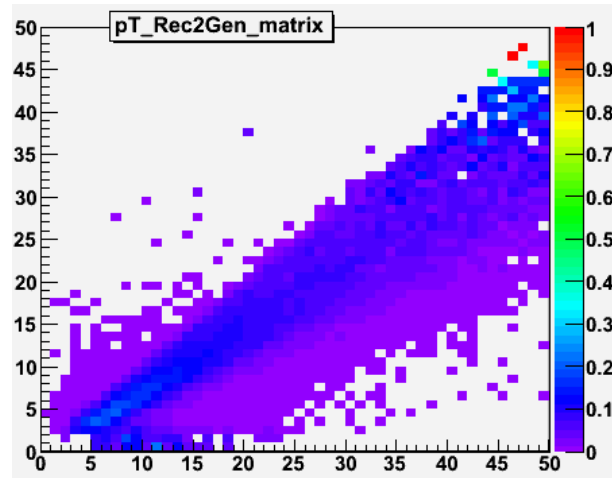
Unfolding

- The differential b -hadron cross section vs. $pT(H_b)$ is extracted from the measured differential ones of $H_b \rightarrow J/\psi X$
- Distortions between pT distribution of b hadrons and J/ψ s from them

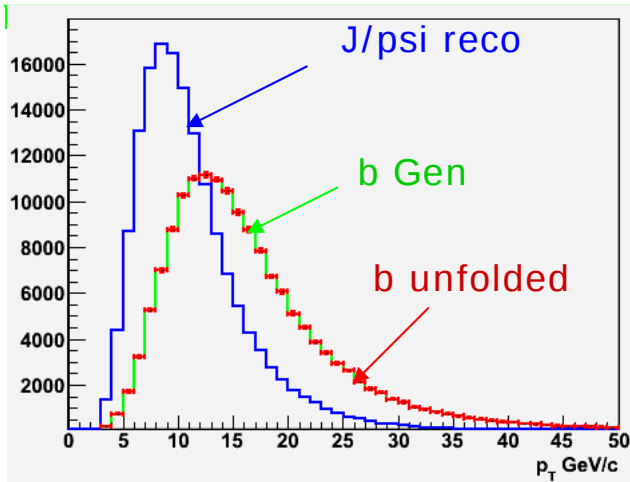
Correlation Matrix



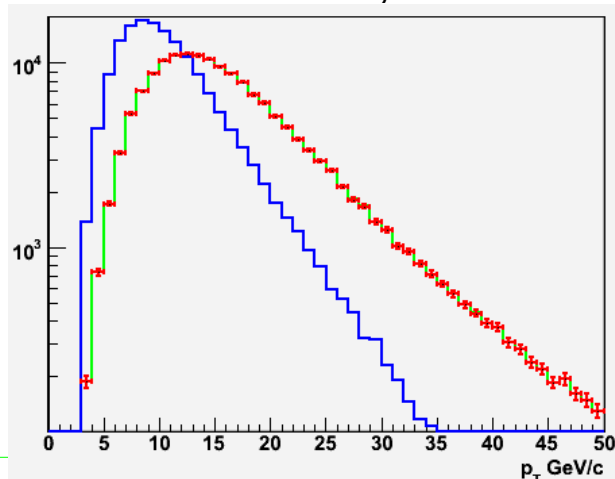
$$\Delta R^{J/\psi} < 0.01$$



Unfolding on M.C. data



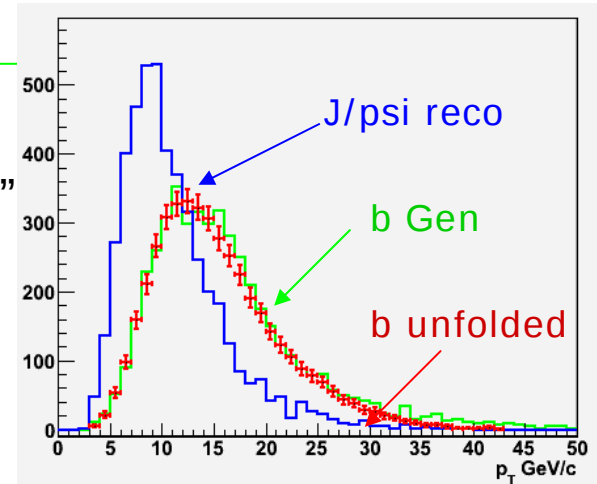
M.C. big sample
Nevt: 160,000



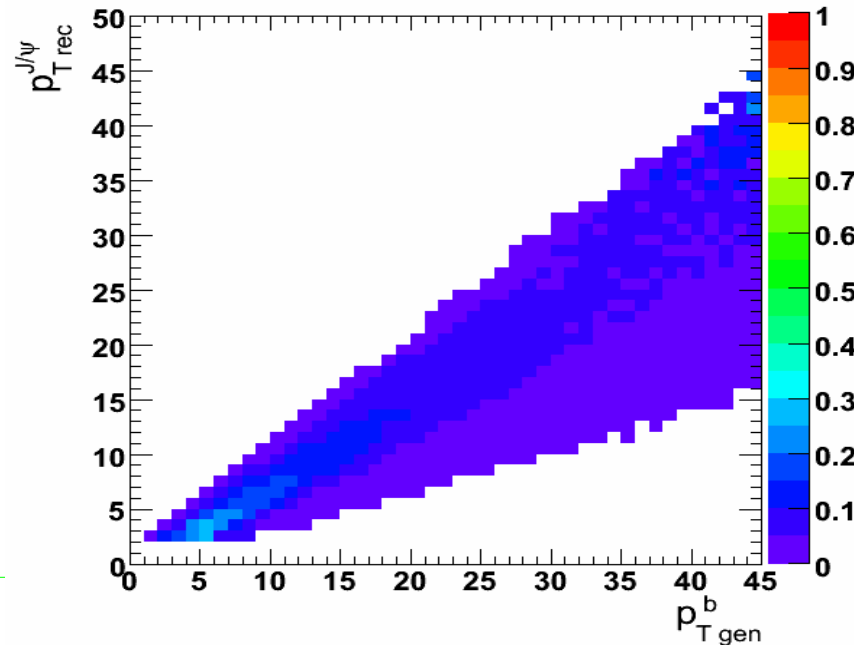
2009-02-27

CMS B-physics

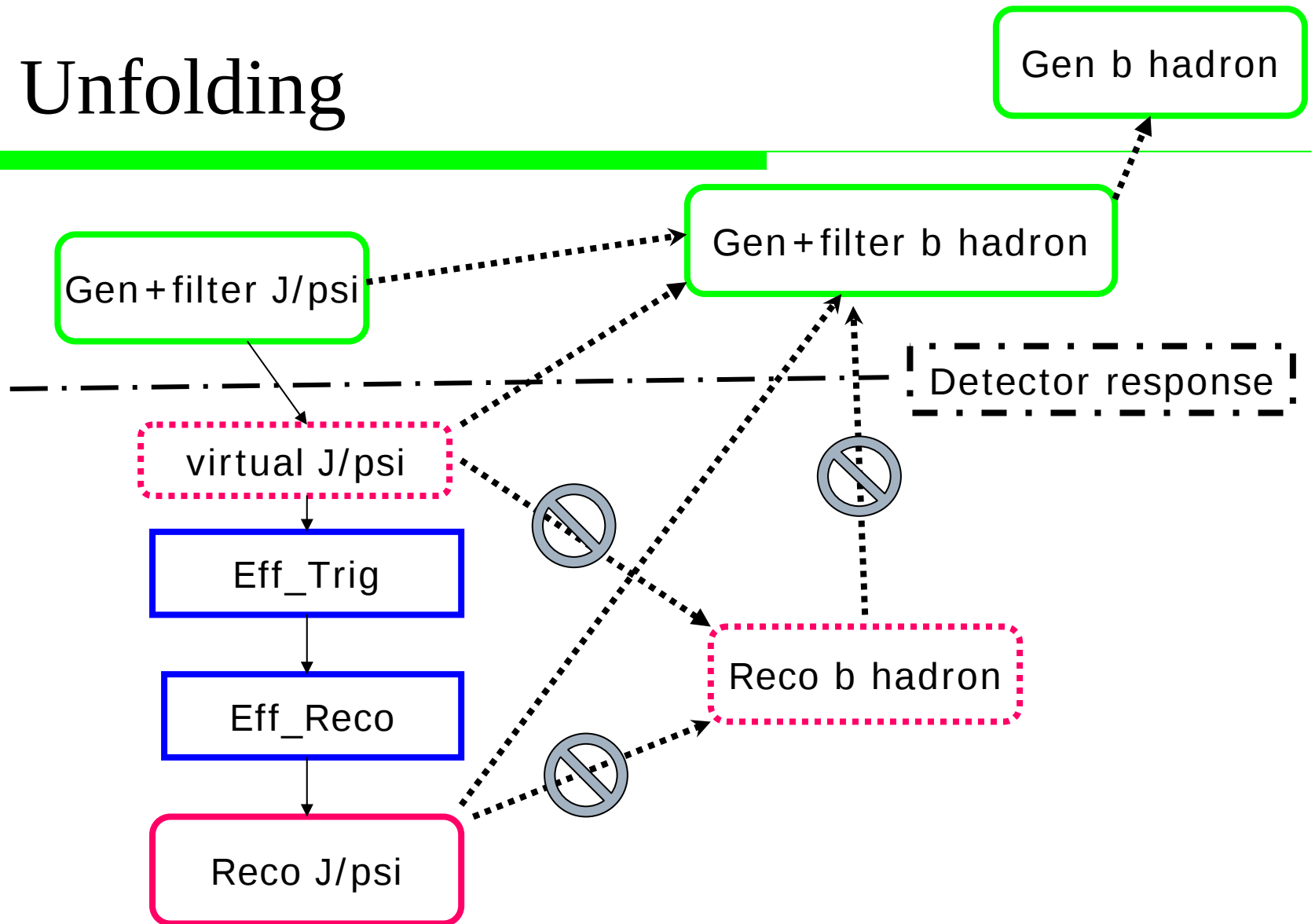
M.C. "real data"
Nevt: 4760



Correlation rec J/ψ to gen b : unfolding Matrix

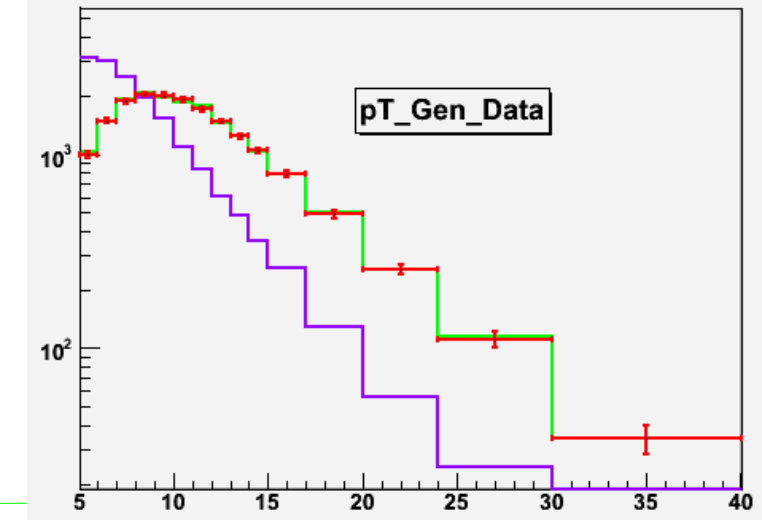
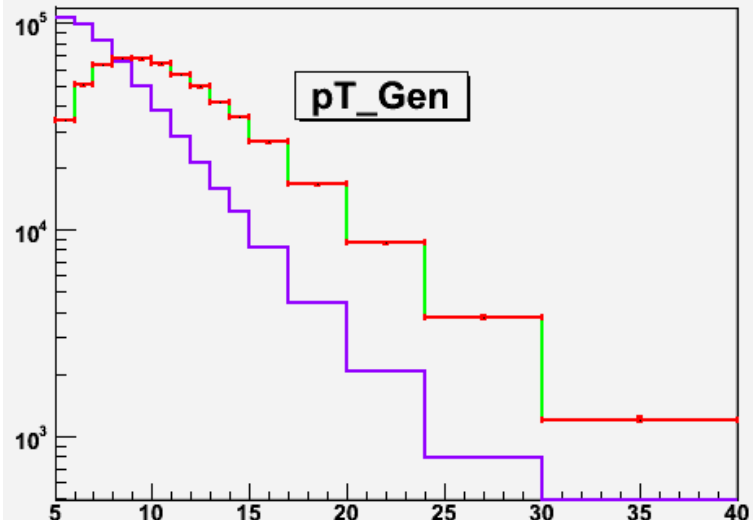
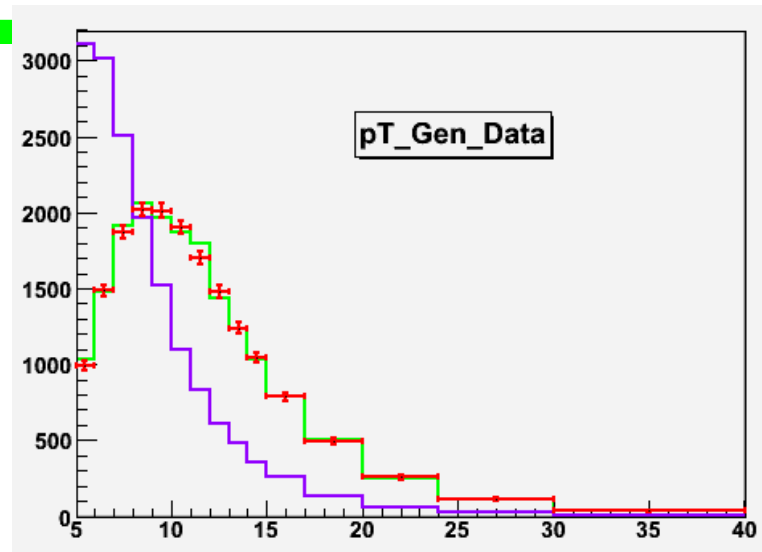
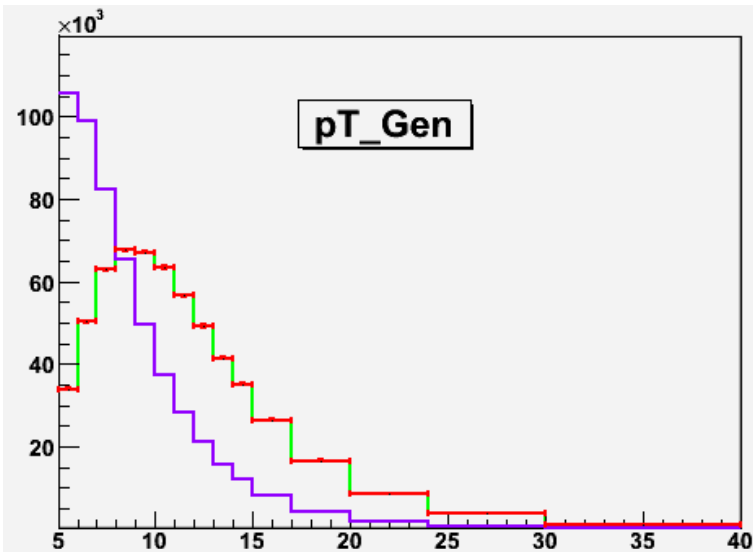


Unfolding

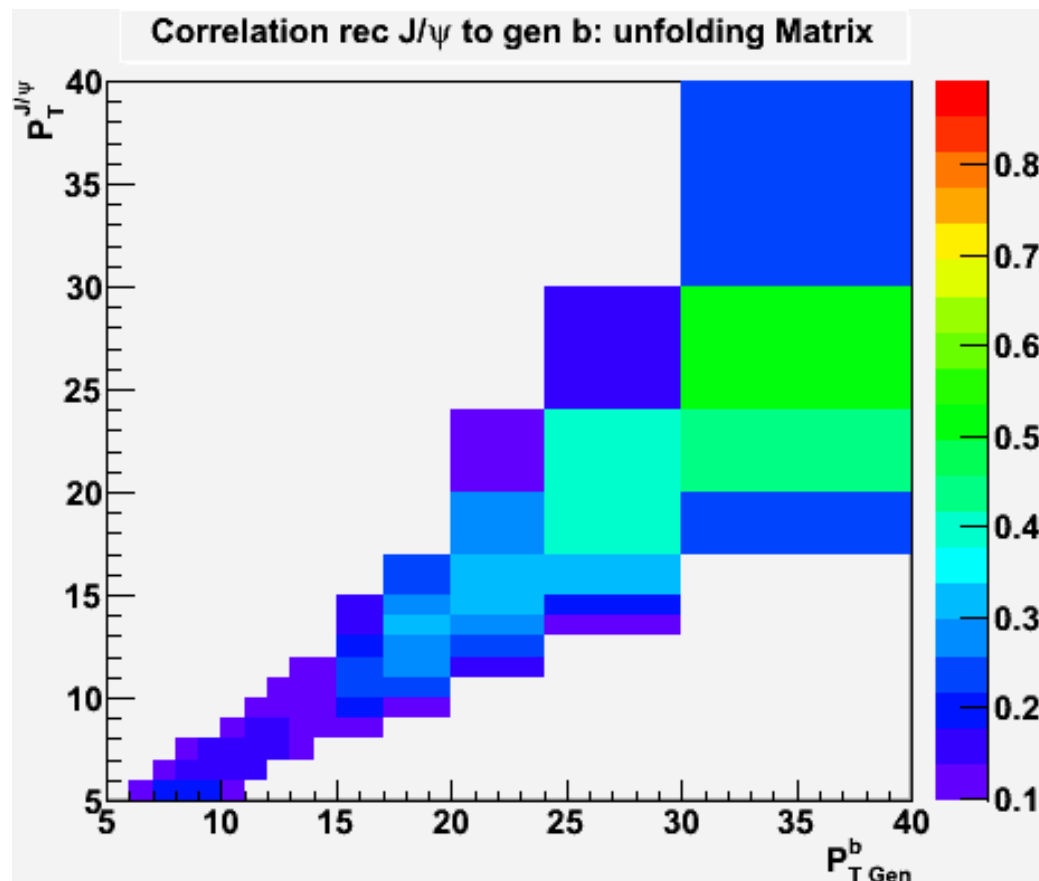


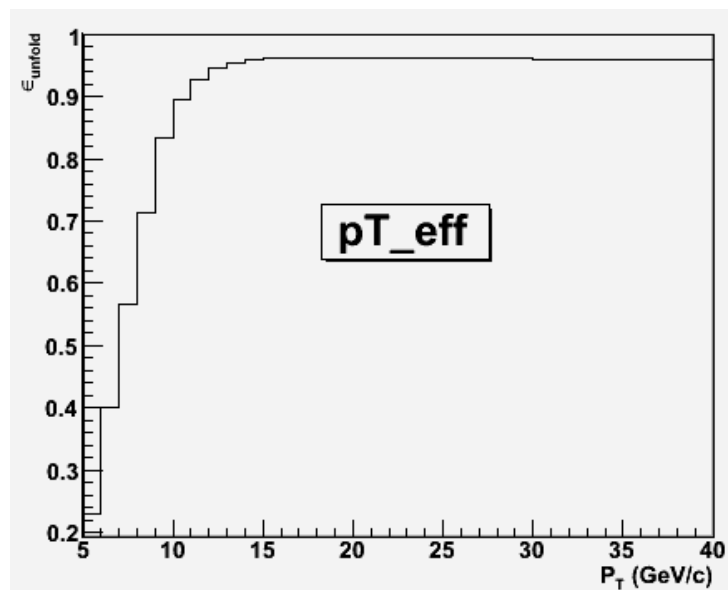
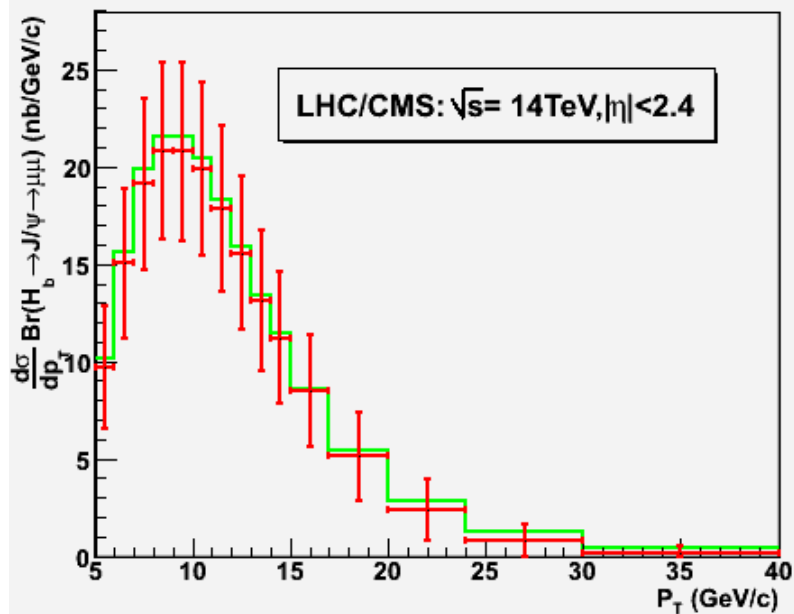
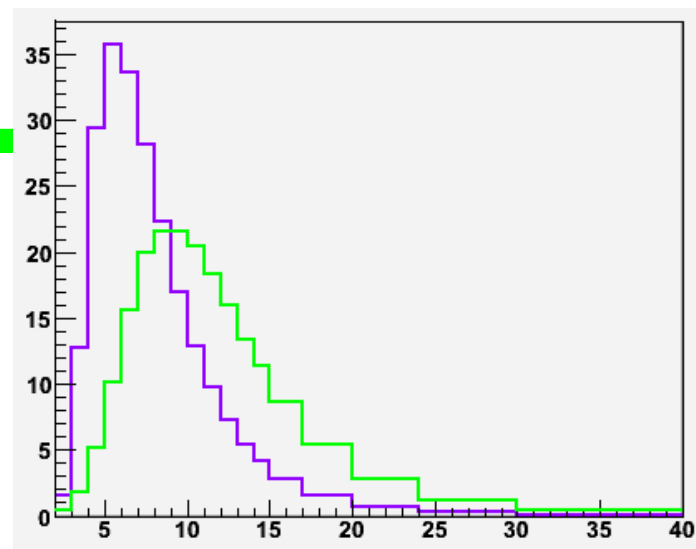
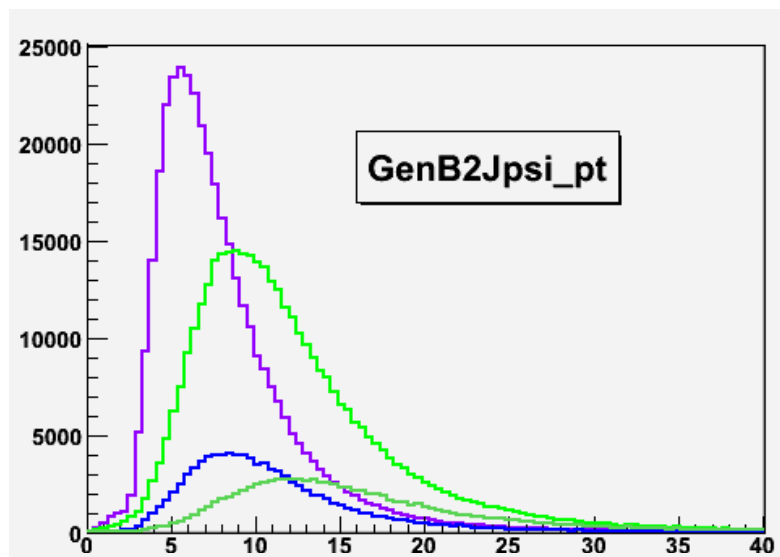
M.C. big sample
Nevt: 700,000

M.C. “real data”
Nevt: 20946



Unfolding Matrix







backups