General

In all present cross section studies

Jets

From towers with a seeded cone algorithm (DR=0.4). The applied calibration constants are the global H1-inspired ones.

Missing energy

Sum of contrib from

- cells in electrons and photons
- cells in jets
- cell in topoclusters out of objects
- corrections for muons and cryostat

cells from jets and taus are calibrated with H1-global weights

Overlap removed between jets and electrons by 0.2 DR cone

Local Had Calib impact is not tested

Get estimate of relative size of effects: benchmark

Single lepton: Cross Section Extraction

ATL-COM-PHYS-2007-100

Jet Multiplicity method(s) (a la CDF)

(study performed on FDR1 data)

Select inclusive W en sample

Calibrate el energy and E^{T}_{miss} scale from data, "tag and probe" for el eff.

Count signal in high mul. bin ($N_{jets} \geq 4$)

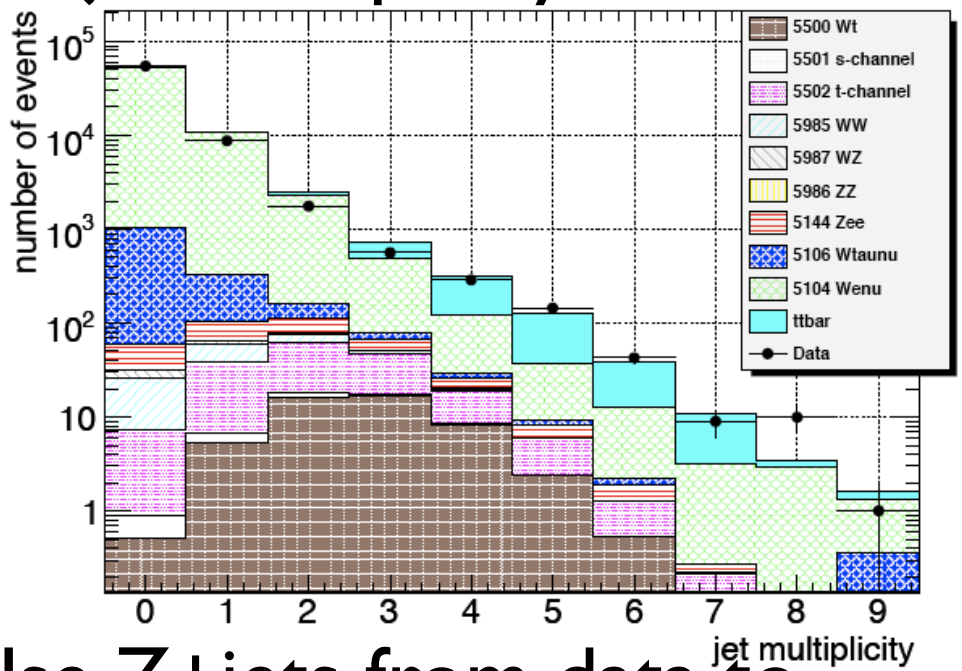
Subtract electroweak bkg extrapolated from 0+1 jet mul. bin. For others use MC

I

Extract cross section by scaling with MC acceptance, filter and luminosity

$$\sigma_{t\bar{t}} = \frac{N_{t\bar{t}}}{\mathcal{L}\,\varepsilon_{\text{trigger}}\,(A\varepsilon_{\text{reco}})\,\varepsilon_{\text{filter}}}$$

Use jet multiplicity distribution



II

Use Z+jets from data to derive W+jets in signal region

III

Fit the N-jets data distributions with MC templates for sig and bkg

Single lepton: Cross Section Extraction

Counting method

Perform counting experiment and calculate

(from T6 summary talk- April08)

$$\sigma = \frac{N_{\text{sig}}}{\mathscr{L} \times \varepsilon} = \frac{N_{\text{obs}} - N_{\text{bkg}}}{\mathscr{L} \times \varepsilon}$$

where

N_{obs} number of observed selected events

N_{bkg} number of estimated bkg selected events from MC and/or data

$\mathscr{L}$ integrated luminosity

ε total efficiency (geometrical, trigger,event selection)

Monte Carlo samples broken in 2 stat indep parts: to have pseudo data and simulation

sensitive to bkg normalization, less to shape

Single lepton: Cross Section Extraction

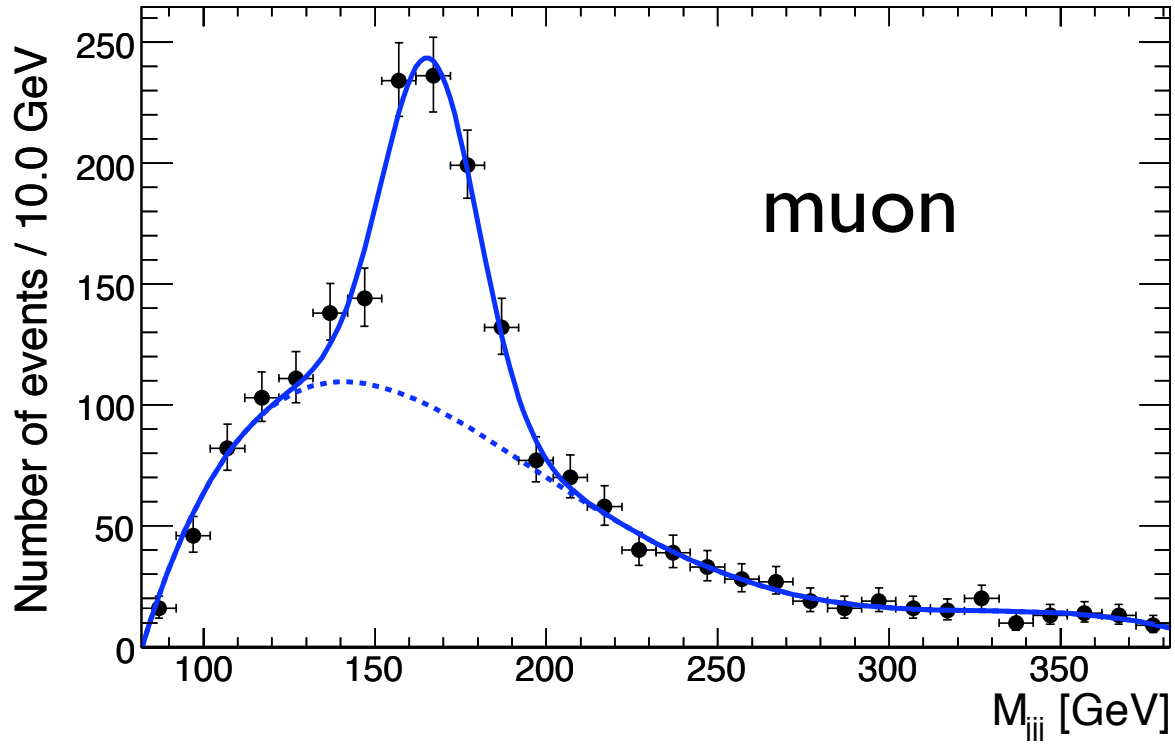
Likelihood fit method

(from T6 summary talk- April08)

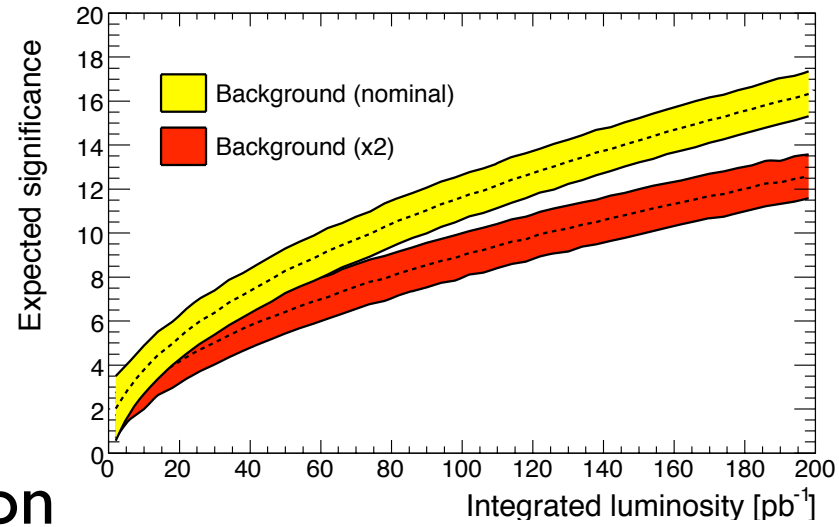
Assume 3jet mass dist using Gaussian signal +Chebychev pol bkg

Build unbinned likelihood as a function of Nsig and N bkg

Maximize it to extract Nsig



Extract Xsec by scaling with event selection and reconstruction eff



sensitive to mass shape recon