# Weekly Report

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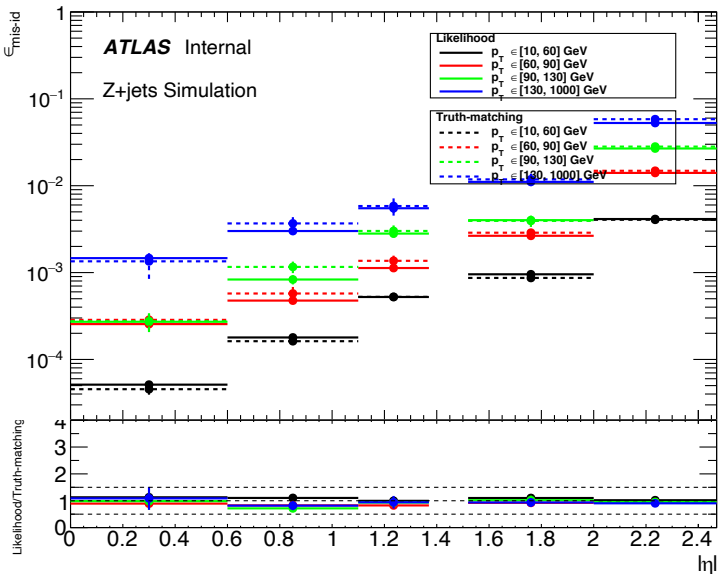
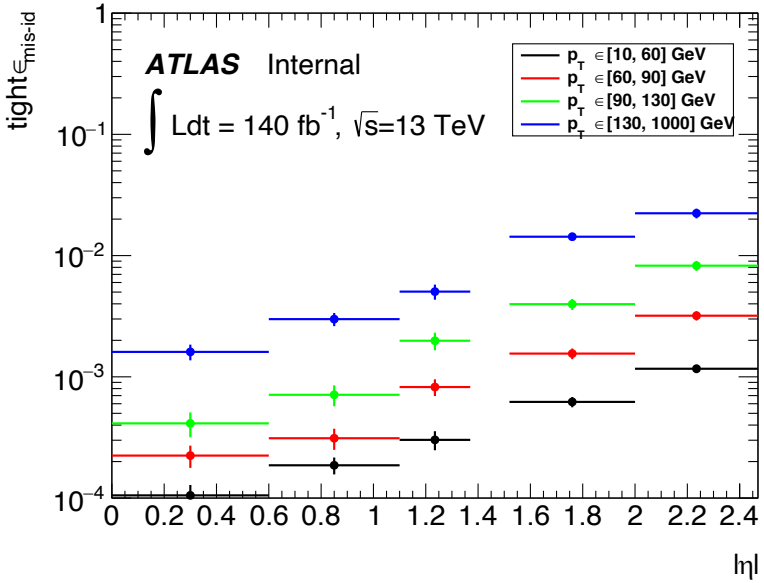
# QmisID rates



# Top mass

- The generator : whizard2
  - Is to have a reasonable efficiency
  - Got in trouble of installation
- Is it necessary to analysis top mass spectrum directly ?
  - Gang suggested to focus on threshold scan
  - We can do better on data taking strategy
  - For example, to reach 0.02%(35MeV) uncertainty of mass, how much luminosity should be collected?

# Threshold scan

- The uncertainties of $m_{top}, \alpha_s$ can be extracted from the dependence of production cross section on beam energy.
- Determining from a 2D maximum-likelihood fit( or chi2 fit ) to top pair cross section MC simulation .

- Expected #events
  - $N = (\varepsilon * B * \sigma_{signal} + \sigma_{bkg}) * \mathrm{lumi}$
  - $\varepsilon$ : total efficiency = acceptance * select efficiency
  - $B$ : branch ratio of $t\bar{t} \to WbWb \to qqbqqb(46\%)\ or\ t\bar{t} \to WbWb \to qqbqlvb(30\%)$
  - $\sigma_{signal} = \mathrm{f}(\mathrm{m_{top}}, \alpha_s, E_{cms})$ : signal cross section. Patten of analytical relation?
  - $\sigma_{bkg}$: bkg(QCD process of diboson or triboson) cross section

| type | final state | σ 500 GeV | σ 352 GeV |
|---|---|---|---|
| Signal ($m_{\mathrm{top}}$ = 174 GeV) | $t\bar{t}$ | 530 fb | 450 fb |
| Background | $WW$ | 7.1 pb | 11.5 pb |
| Background | $ZZ$ | 410 fb | 865 fb |
| Background | $q\bar{q}$ | 2.6 pb | 25.2 pb |
| Background | $WWZ$ | 40 fb | 10 fb |

# Backup

❖ Cutflow table