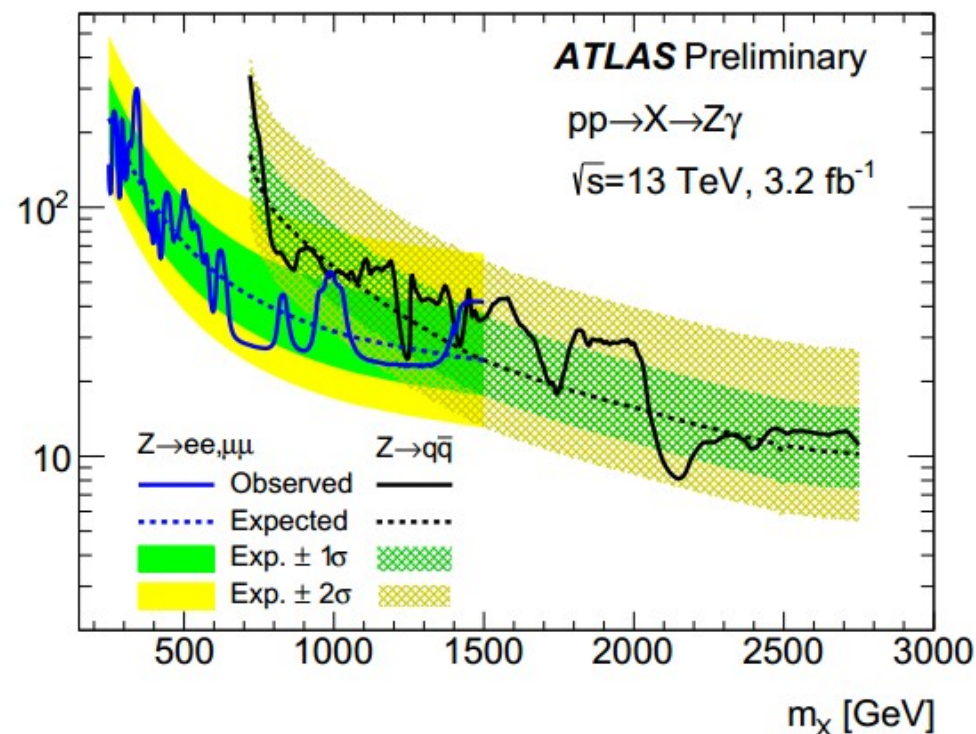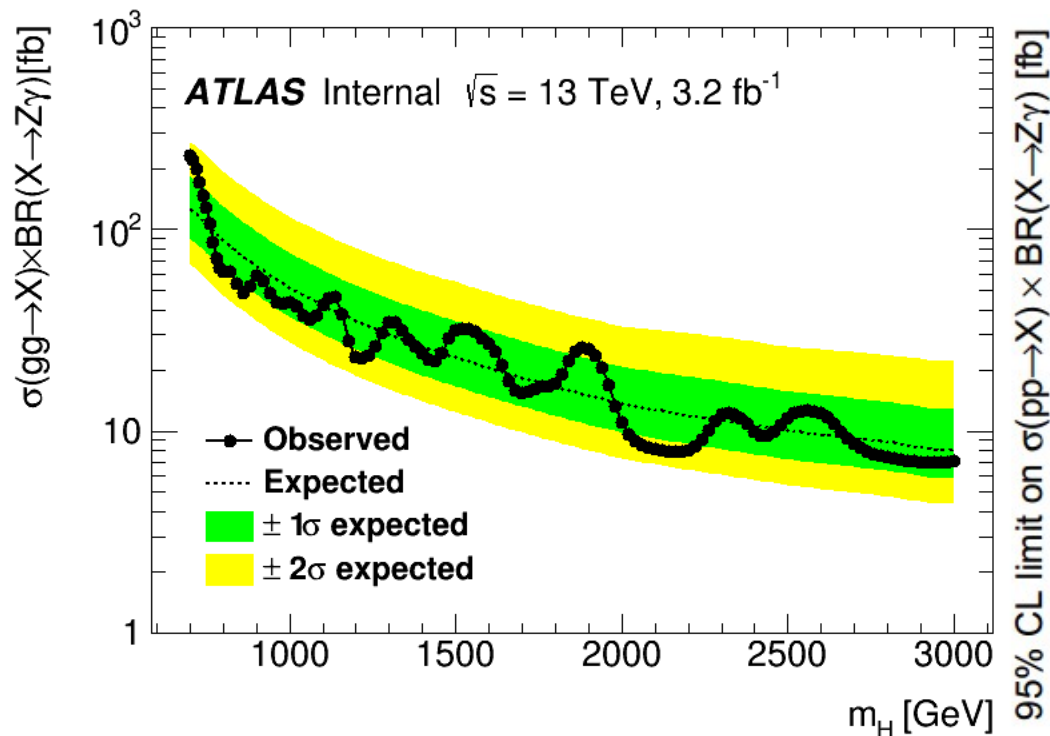# Weekly

Xiaohu SUN
IHEP
2016-03-29

Updates in workspace

- Using the latest generate_signalTemplates-5.C

  - Updated GRL, should affects data and obs limits in 1000-1500GeV

  - Add lepton veto, affecting high mass efficiency (>2000GeV), dropping ~<3%

  - Need to add CrossCalib uncertainty due to D2 RUN 1 calibration

# Compare limits by numbers

Unbinned @ 750
Observed   127.747
Median   106.347
+2 sigma   236.509
+1 sigma   157.502
-1 sigma   76.6287
-2 sgima   57.079

Binned @ 750
Observed   190.11
Median   124.25
+2 sigma   313.79
+1 sigma   188.44
-1 sigma   89.53
-2 sgima   66.69

Cut proposal for paper

- Andrea proposed relative pT cuts for boosted analysis, although leptonic side only wants to send out a paper ASAP without any updates/re-optimization etc … this needs discussing in conveners' level
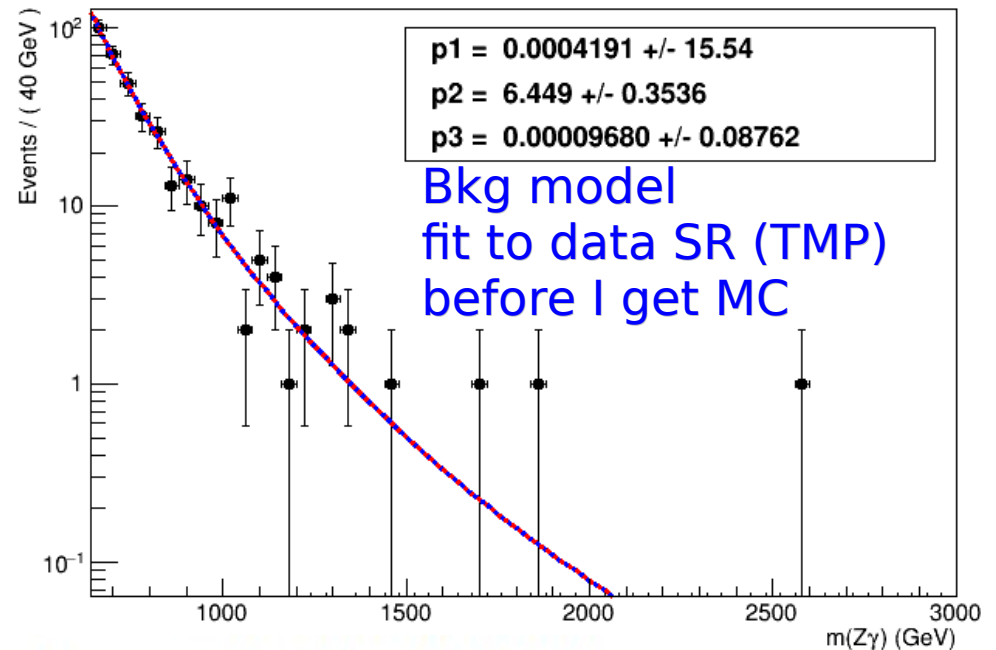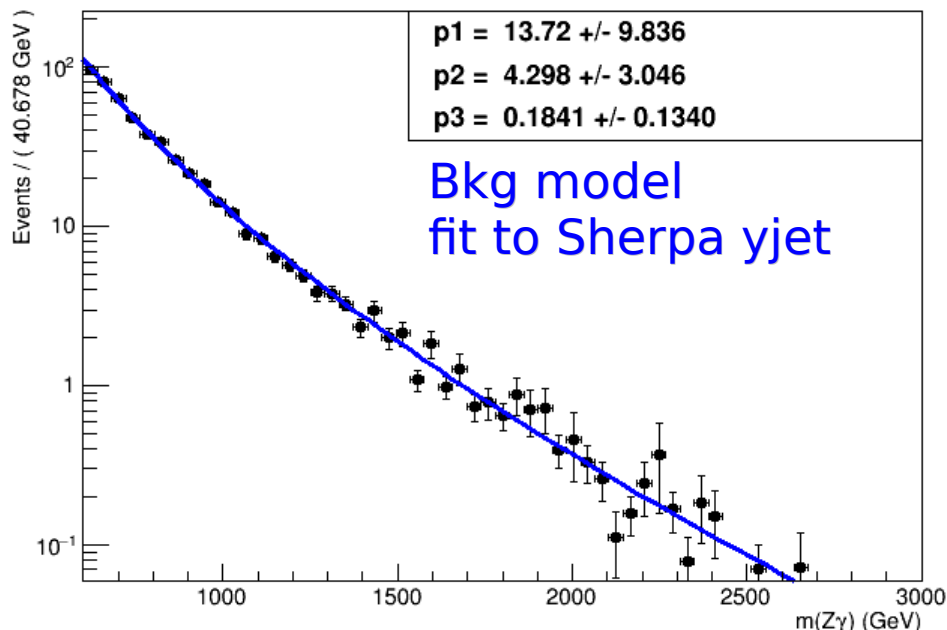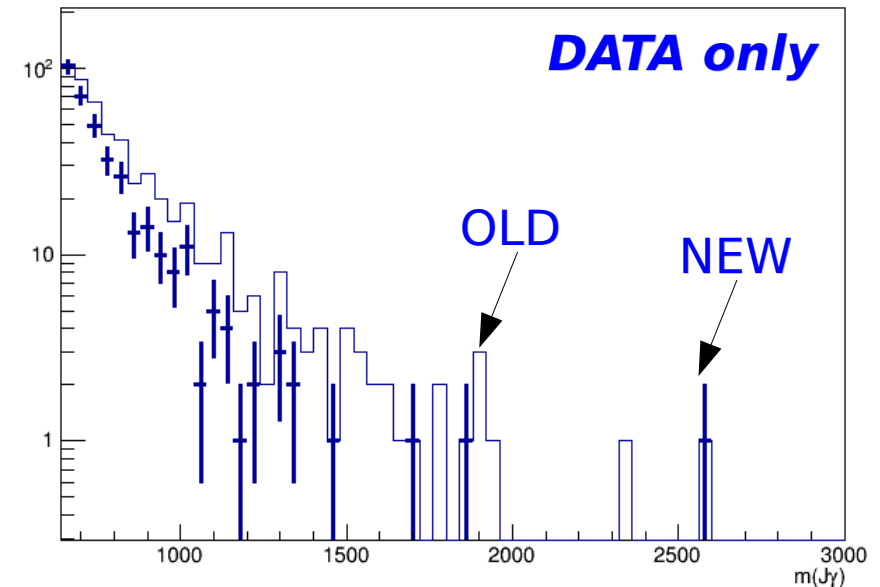

$Pt(\gamma) > 0.4 * m(J\gamma)$

CONF Note Selection + pt/m(Jγ)>0.4
pt (γ) > 250 GeV
pt (γ) > 140 GeV
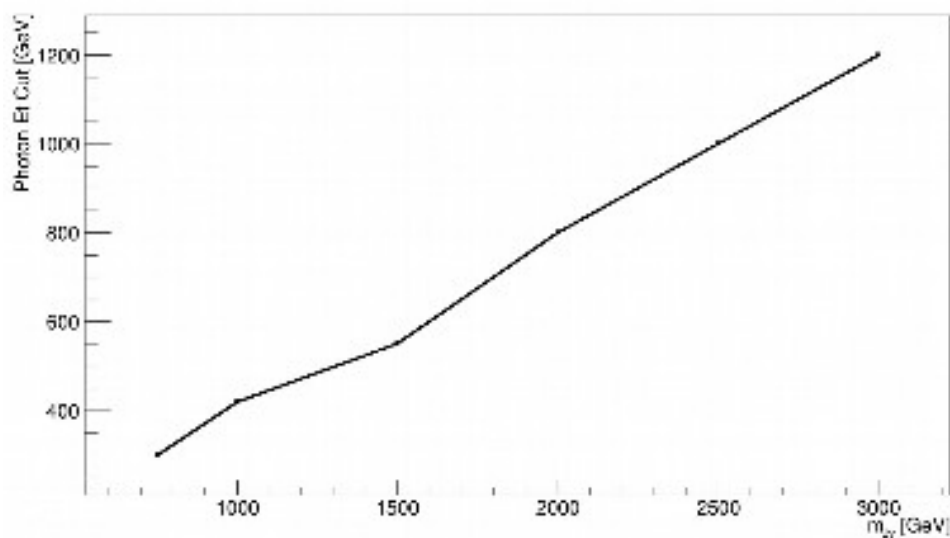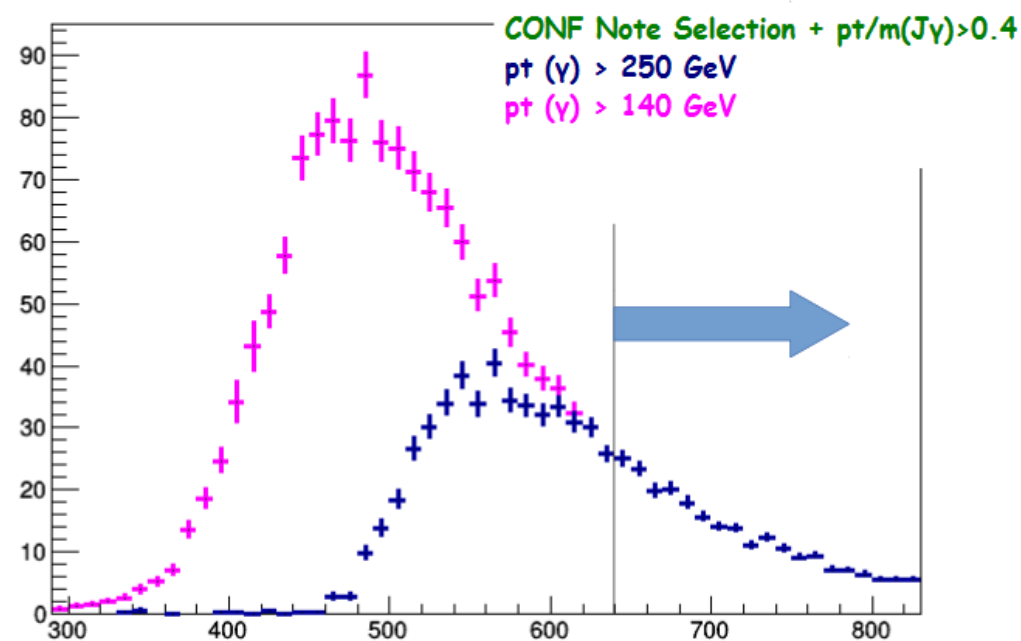
$Pt(\gamma) > 140$ GeV

After using relative pT cuts

- ## BKG shape changed!

- ## BKG model adapts the changes; p2 term remains (p1,p3~0)

DATA only

OLD   NEW

p1 = 13.72 +/- 9.836
p2 = 4.298 +/- 3.046
p3 = 0.1841 +/- 0.1340

Bkg model
fit to Sherpa yjet

p1 = 0.0004191 +/- 15.54
p2 = 6.449 +/- 0.3536
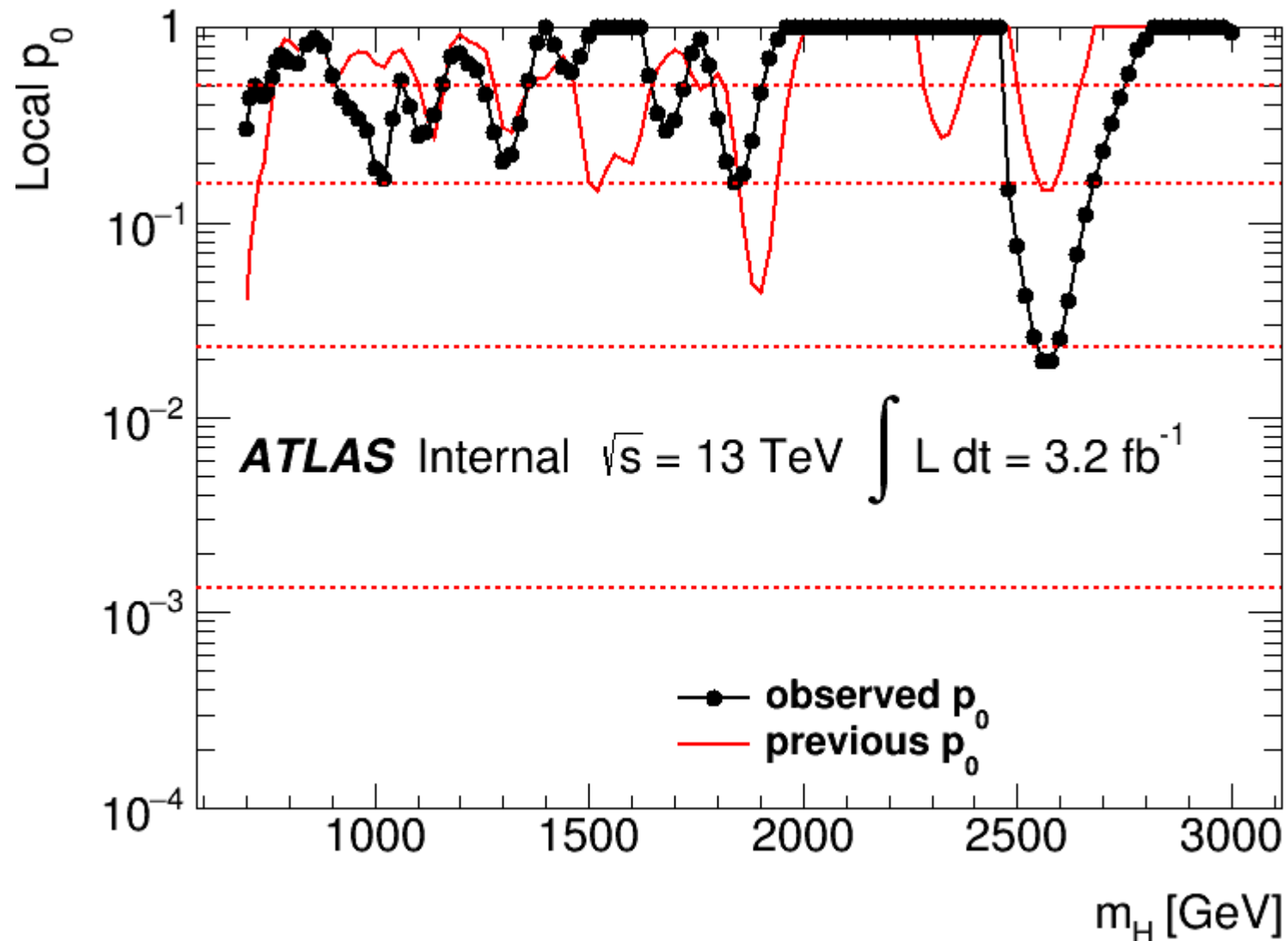p3 = 0.00009680 +/- 0.08762

Bkg model
fit to data SR (TMP)
before I get MC

$$f_b(x \equiv m_{\gamma j}/\sqrt{s}) = p_0(1-x)^{p_1}x^{-p_2-p_3\log(x)}$$

New limits

- Some differences in terms of data excess/deficit are seen

p0
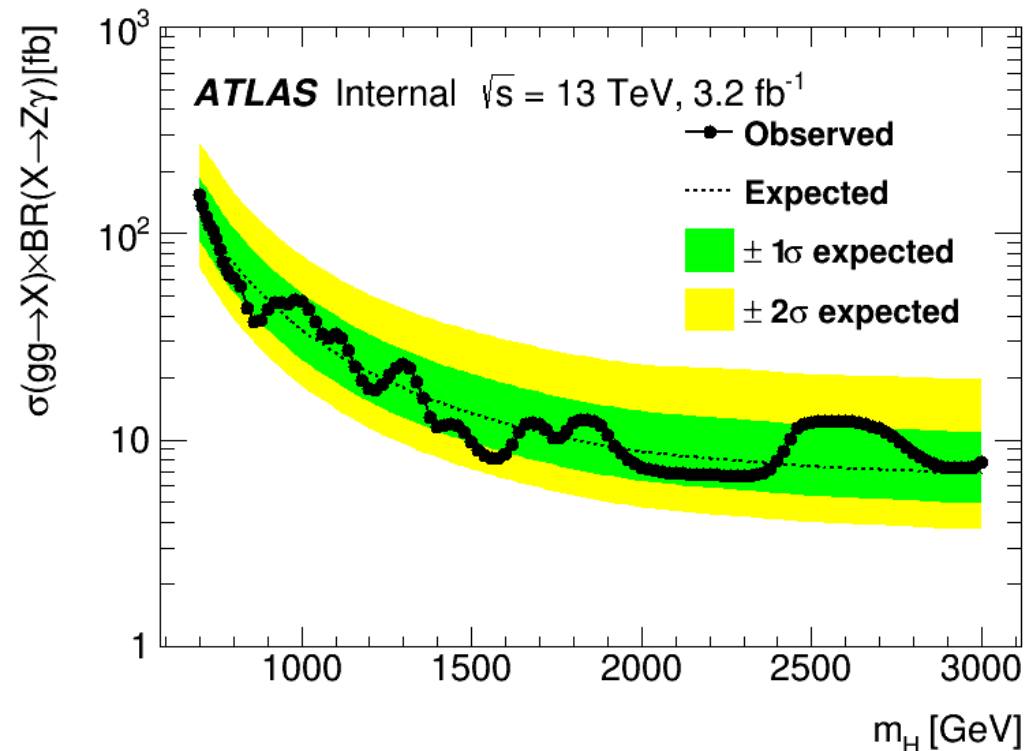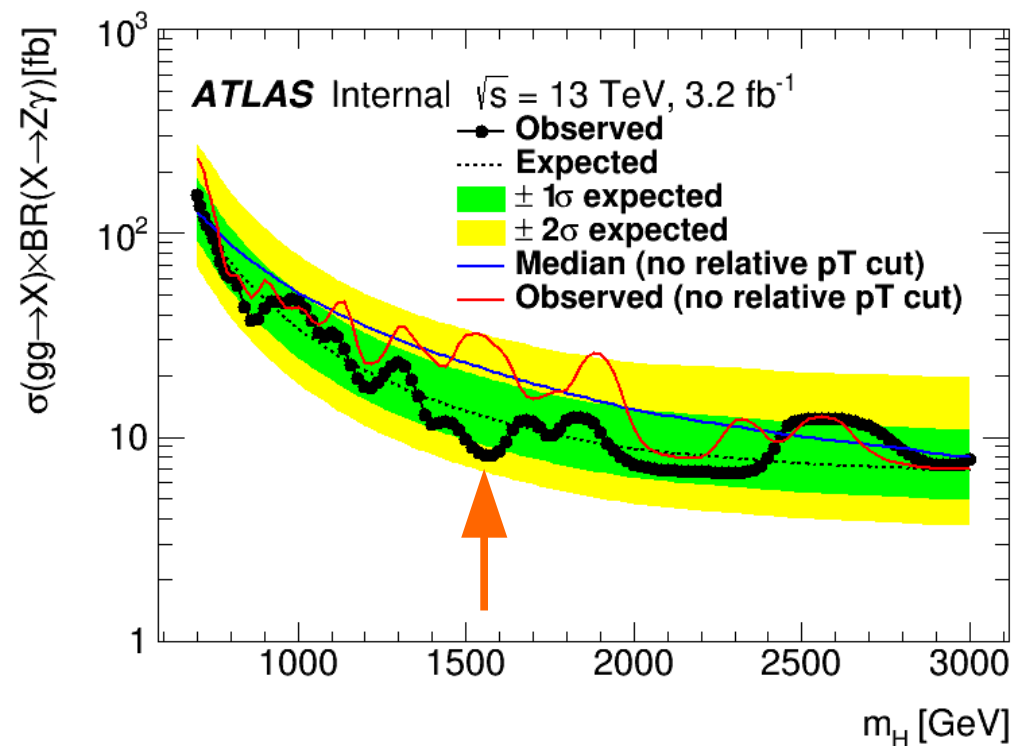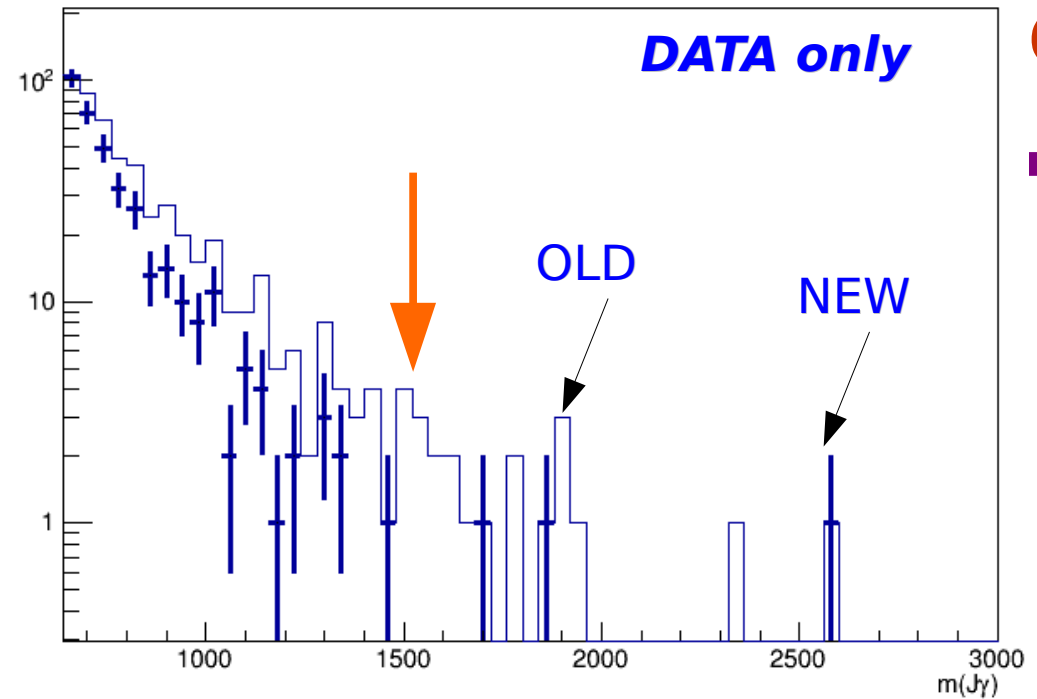
- ## P0 using asymptotics

2HDM & singlet

- I am producing theory calculations for XS and BR of 2HDM and singlet

- Singlet can come in next week

  - Much less phase point than 2HDM

  - But needs an interface for users

- 2HDM might come in two weeks

  - With updated VBF/WH/ZH XS from LHCXSWG