pMSSM grand scan status

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pMSSM Scan Meeting

What's running: 400 parallel scans

- 200 threads with the nominal setup

  - Saw the first 100 converging to $\Delta a_\mu \sim 250$ ([gif](#))

- 200 more threads with the same setup but without Δa_μ in the McMC likelihood, to populate $\Delta a_\mu = 0$

- Test scans with different stepping functions

  - Amounts to only a few thousand points

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Progress of the scan

- Threads 1-200: with Δa_μ
  - 1-100 started ~Oct, 101-200 started in Jan

- Threads 201-400: no Δa_μ
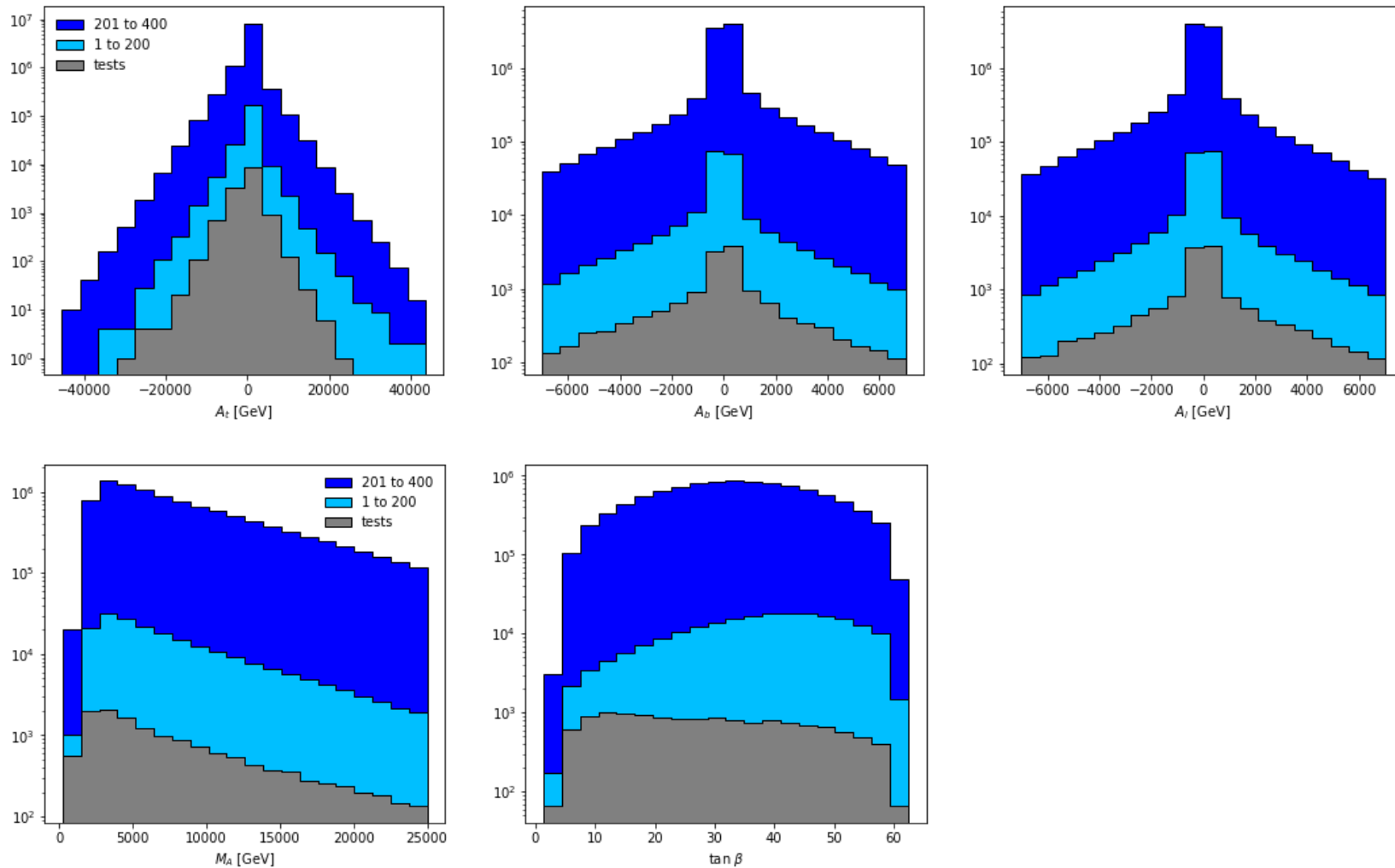 - Much higher efficiency
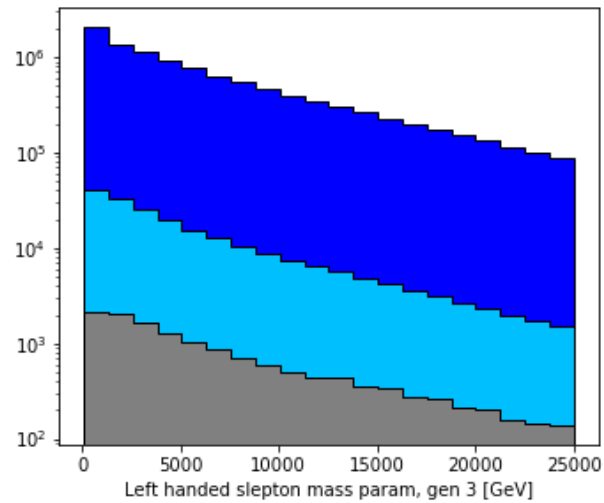
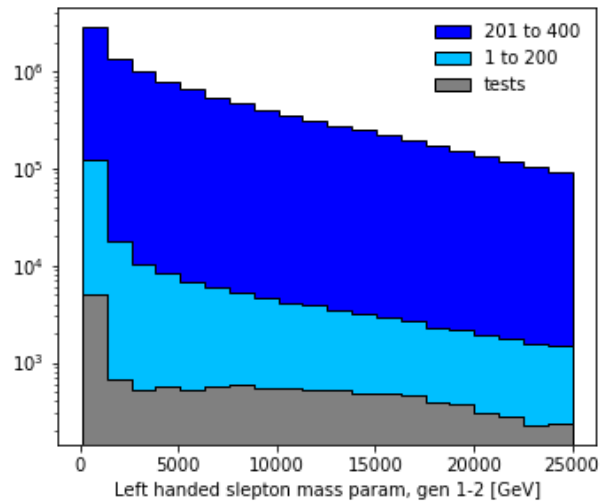🟰 Fermilab
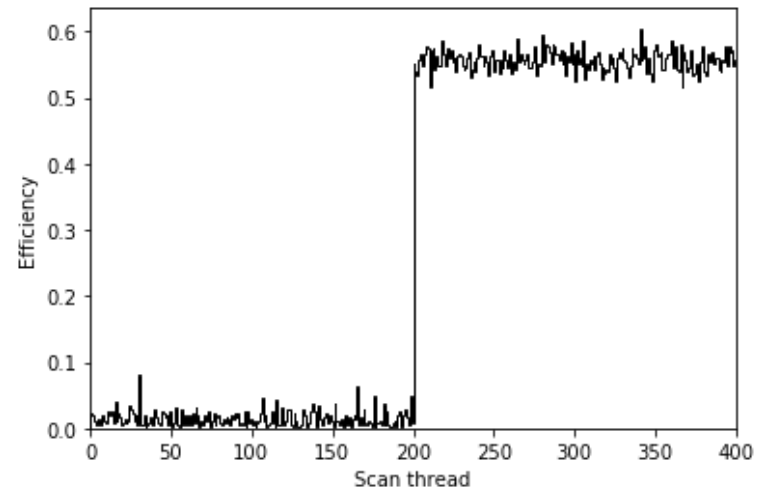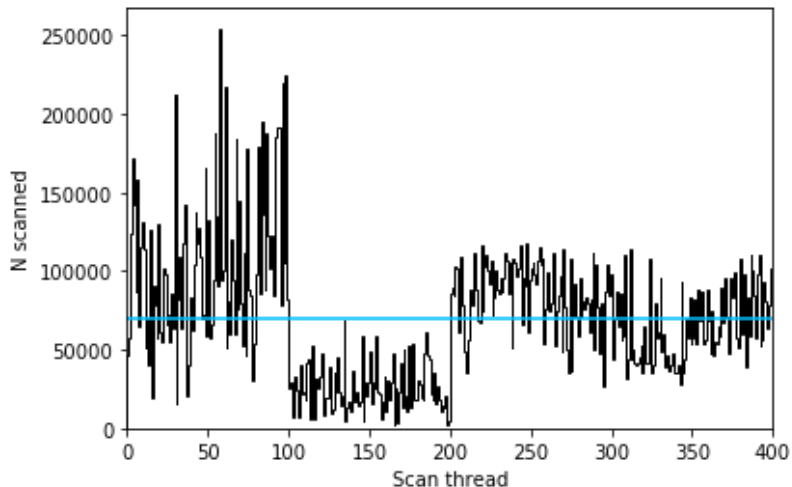
Progress of the scan

- So far, scanned 28,768,213 points (up from 5.6M on 01/12)

  – MCMC accepted 10,368,890 (up from 61k on 01/12)

  – At least 9,438 passing all cuts (HiggsBounds, Micromegas and SModelS). Likely many more

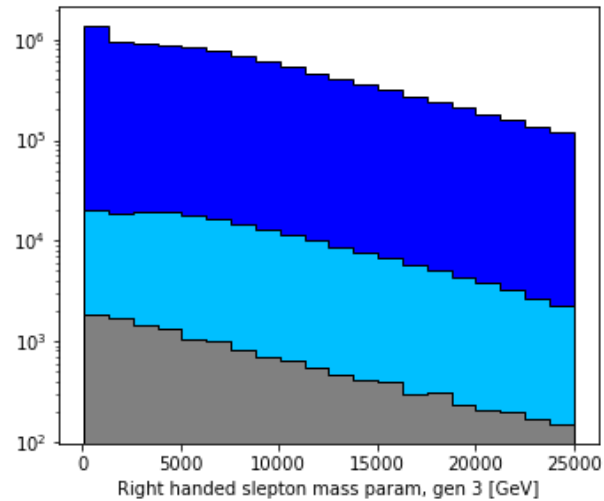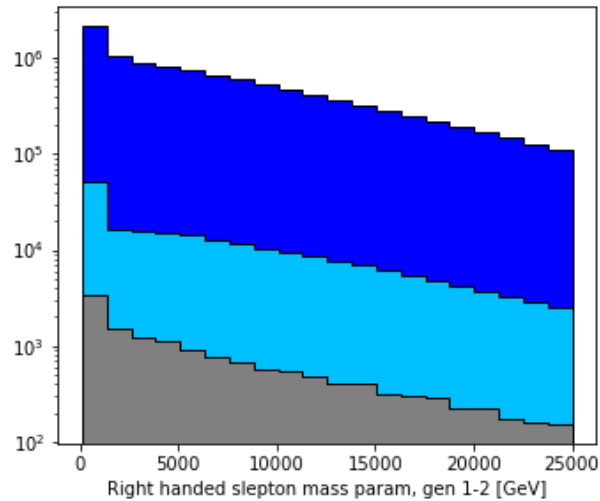   • Have not run post-processing on points produced since mid-Jan

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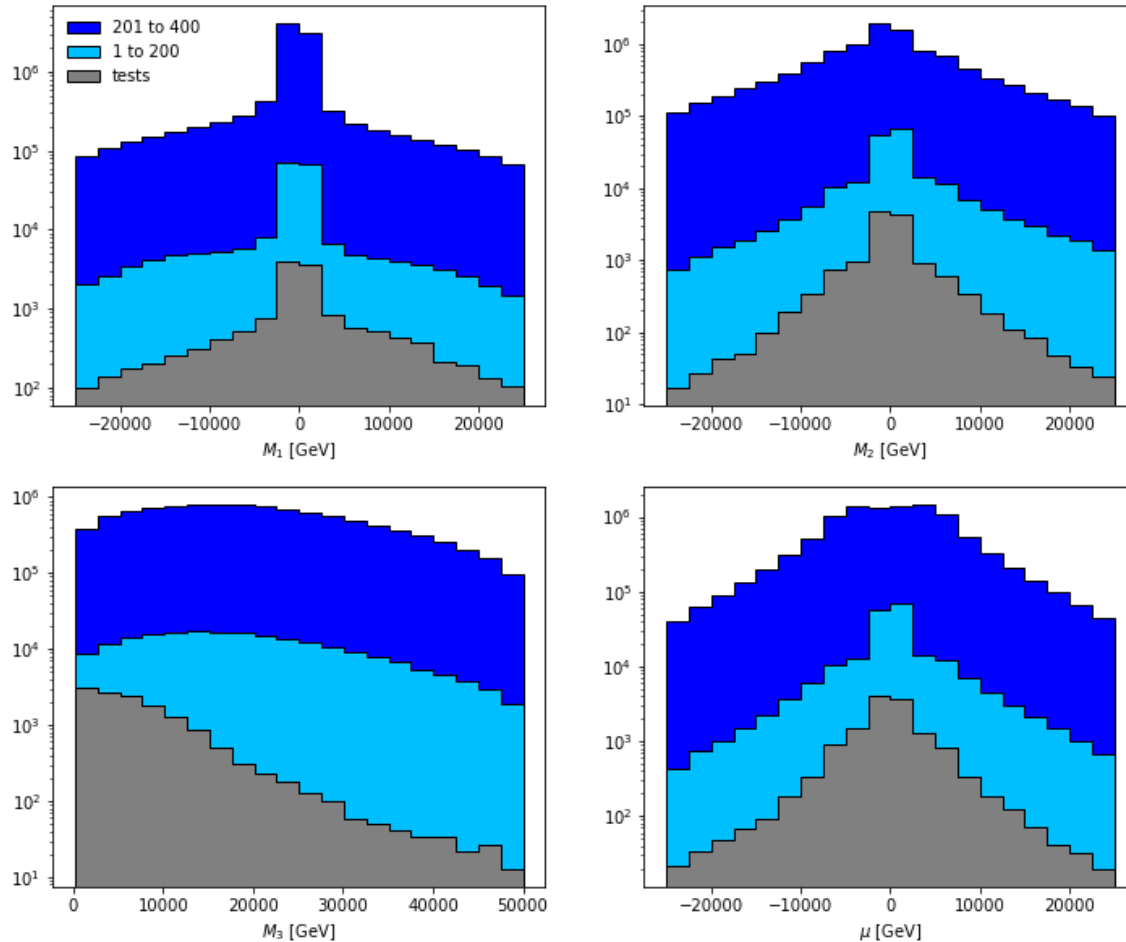# Comparison of with / without Δa$_\mu$

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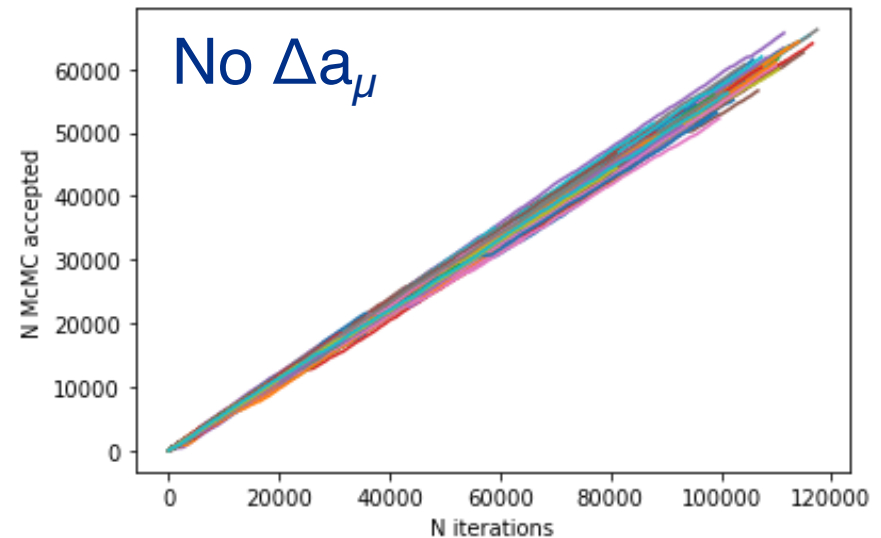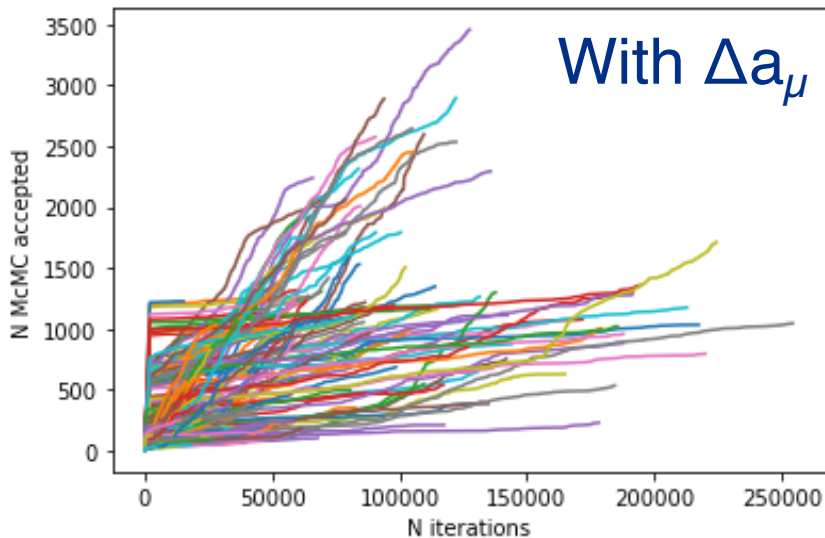
Comparison of with / without Δa_μ

More light
smuons when
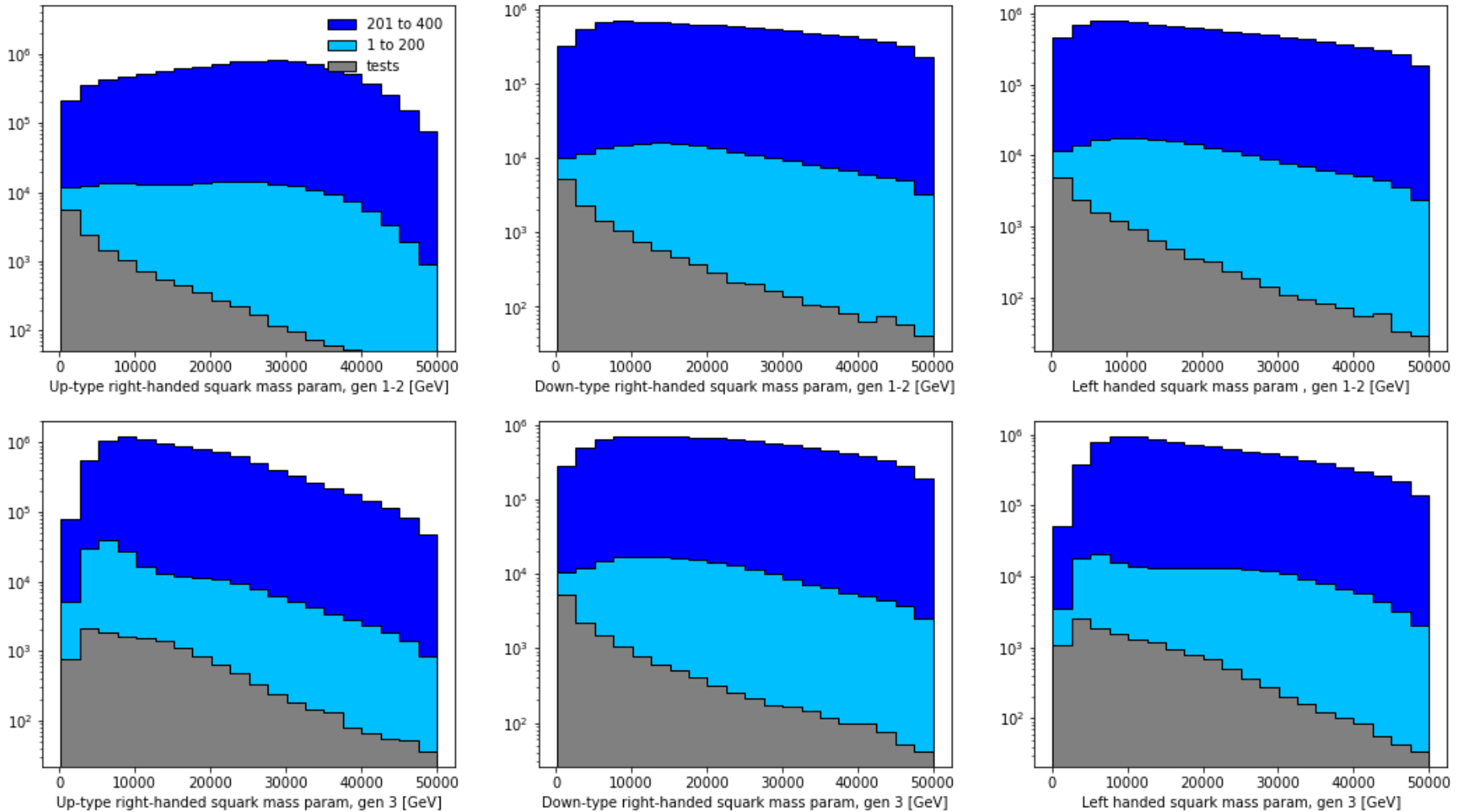Δa_μ is included

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Comparison of with / without Δa_μ
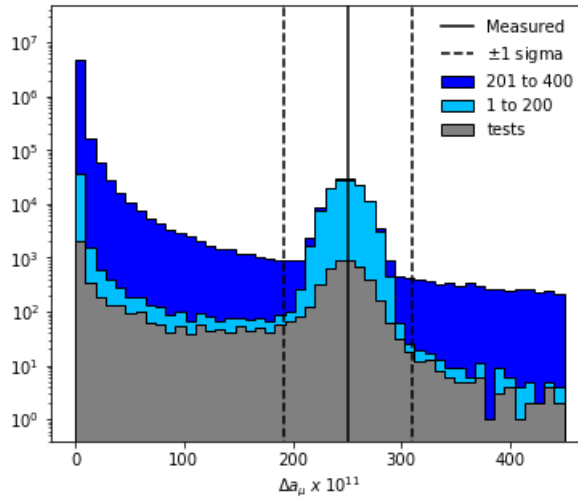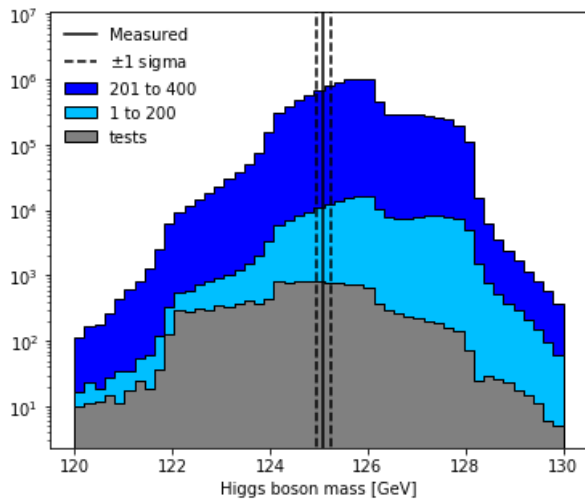

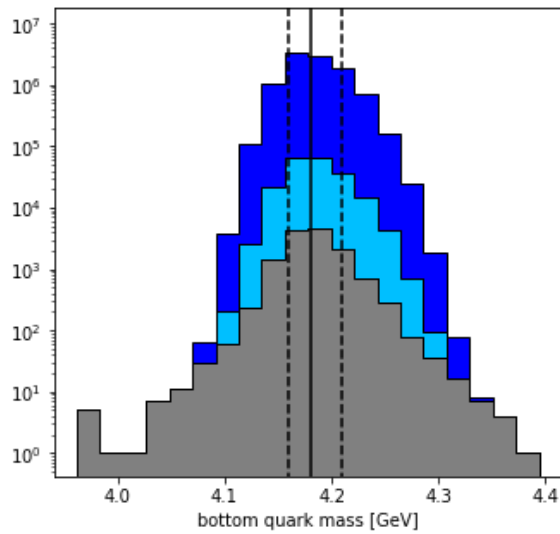Tests use log stepping in gluino mass param M_3

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Comparison of with / without Δa$_\mu$

Tests use stepping in squark mass params

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Comparison of with / without Δaμ

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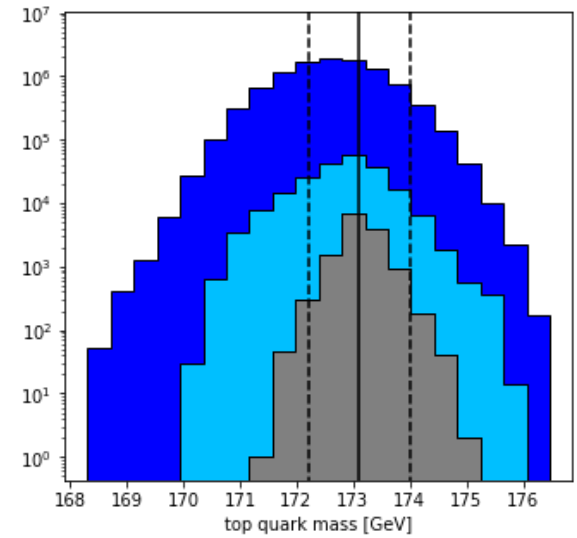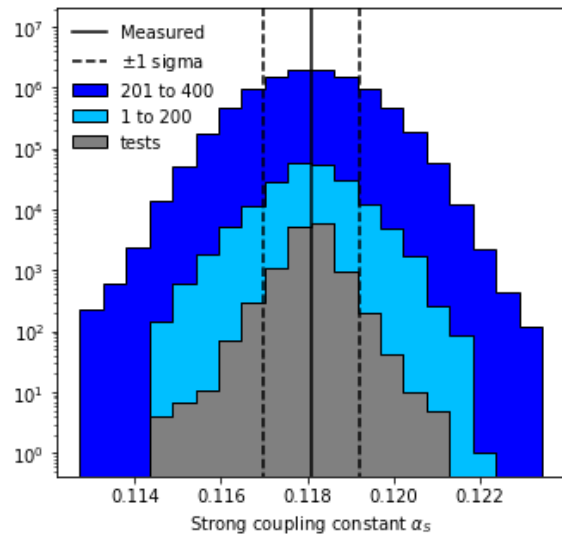
Impact of future measurements

- For pMSSM paper: include the impact of projected future precision measurements on pMSSM space

  – Assume observable X falls into a narrow range projected at a future collider. How does this shape the allowed pMSSM space?

- Parameters to be considered (blue are missing)

  – Higgs mass

  – Higgs couplings: **HHH**, HWW, HZZ, Htt, Hbb, Hττ, **Hμμ, Hcc**

  – Δa_μ

  – DM quantities calculated by Micromegas

  – Flavor observables? (Belle II)

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