# A/H LUTs and what to do with 'em

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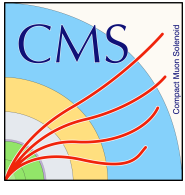
28/08/2020




# Post-meeting agreement

- File can be found in

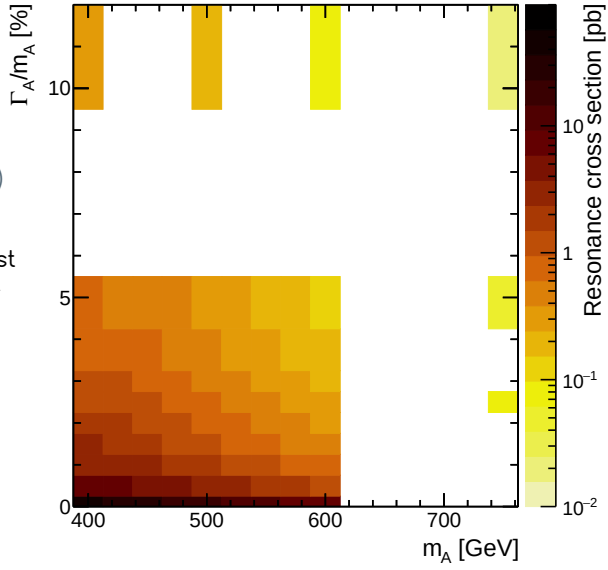
  `/nfs/dust/cms/user/afiqaize/cms/bpark_nano_200218/cmssw_1103_analysis/src/fwk/ahtt/AH1718_xsec_fraction.root`
- Location is temporary, will be moved to a central A/H limit setup later
- To be used to normalize all signal points
- Event sign fractions due to PDF are to be ignored
  - i.e. fractions are ignored in resonance; assume all positive
  - In interference they are assumed to be purely due to A/H, using only the nominal fractions
  - Negative event weights are filled as they are
- Remaining checks if there is a clear PDF trend to be done when LUT is complete

# Introduction

- Among the things A/H interpolation a la 2016 needs are the xsec lookup tables
  - i.e. only shape and acceptance are interpolated, not rates
  - I think this is better than interpolating everything, so I'm sticking with this
  - Lots of gridpacks needed, thanks Sam for making them and Jonas for the weight list
- The LUTs are in-progress, but sufficient to initiate discussion

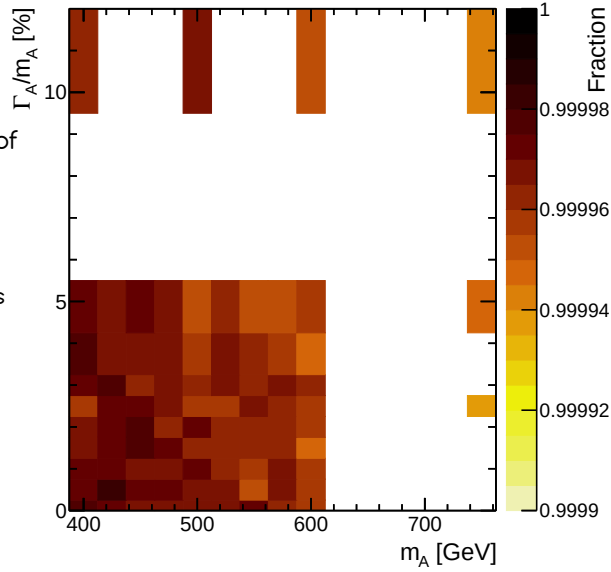
# Proposal

- Normalize all signal to the xsecs in the LUTs
  - Computed with some 2M events/point, should be more precise than the private simulation
  - Helps more with interference
    (recall the 2016 xsec vs weight sum discussion)
- Use full $t\bar{t} \to \ell\ell$ xsec w/o filter eff
  - It's just a single number, I can tack them on last
  - Derived with all events, so stat. unc. is smaller
- Need to agree on ME scales handling
  - Prefer having the rate effect removed, so we can study the impact of LO vs 'NNLO' ME syst
  - The LO-style was one of the dominant syst
  - Best would be having both versions handy



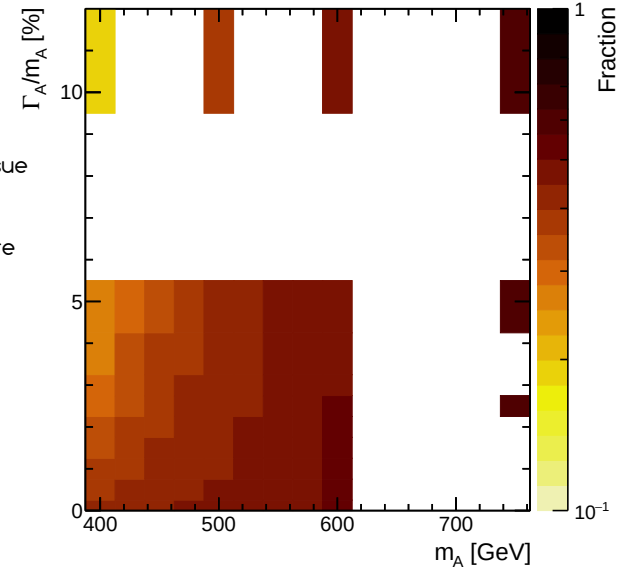
# Some things I saw

- The positive event fractions for resonance points aren't 1
- Alexander said this can be, due to the usage of NNLO PDF, and so is fine
- Proposal:
  - Fill the events with gen weight $\pm 1$ as they are
  - Assume constant frequency i.e. disregard this effect in interpolating resonance
  - Seems sensible to me, since this effect is unrelated to A/H



# Some things I saw

- Sometimes it happens that the scale weights change the sign of interference events
  - Always either one of the $\mu_F$ variations
  - Most likely related to the resonance $\neq \pm 1$ issue
- Proposal:
  - Same as resonance; fill the events as they are



# Afterword

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  `/nfs/dust/cms/user/afiqaize/cms/bpark_nano_200218/cmssw_1103_analysis/src/fwk/ahtt/AH1718_xsec_fraction.root`
- Do check that all numbers aren't crazy!
- In the meantime I'll continue filling them up 6.5% and 8% gridpacks still needed
- k-factor LUTs to be derived, including their scale variations
- To be edited with what is agreed during the meeting

# Backup