Weekly update

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Status of the RSH-signal ($4\ell + \text{Met}$)

Signal samples have already been produced, JIRA, as follows:

- The mass of S is fixed to 160 GeV;
- The masses of R are 400 GeV, 450 GeV, 800 GeV and 1500 GeV:
  - $m_R = 400$ GeV: $m_H = 220$ GeV
  - $m_R = 450$ GeV: $m_H = 220$ GeV and 250 GeV
  - $m_R = 800$ GeV: $m_H = 220$ GeV, 300 GeV and 500 GeV
  - $m_R = 1500$ GeV:$m_H = 220$ GeV, 250 GeV and 1000 GeV
- Is this overlap with DiHiggs $X \to SH$?
- Requested HIGG2D1 derivation with cache: 21.2.55 and p-tag: p3782. It's done, you can see it here; and
- Now I'm working on the mini-tree production using HZZAnalRun2Code .

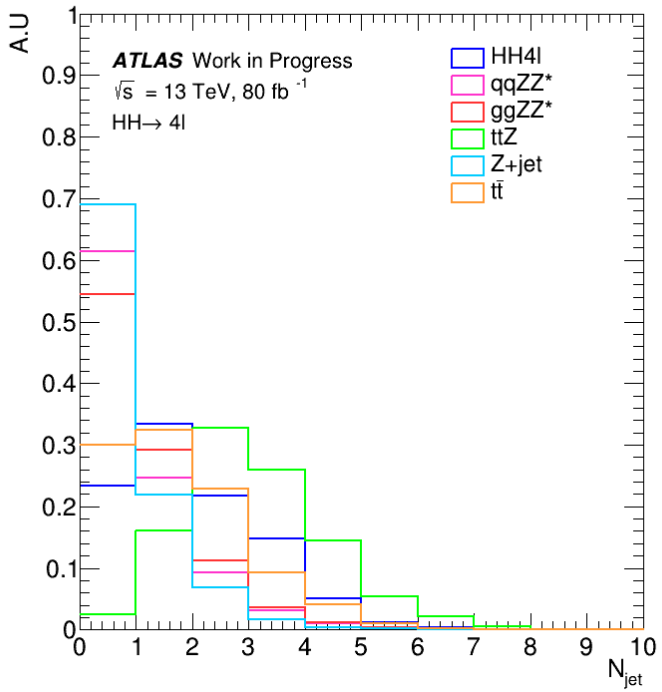
Progress of the $HH \rightarrow 4\ell$ analysis

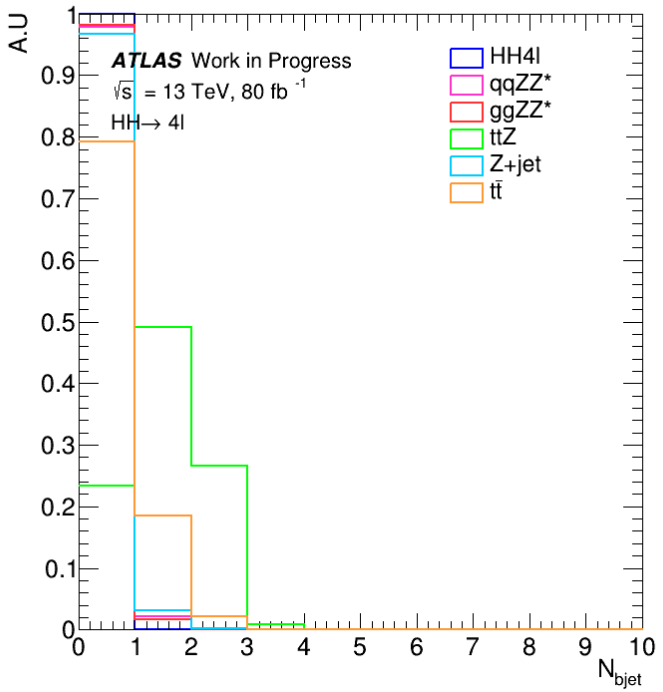
- Preparing for central production for the Multi-lepton ntuple;
- I start working on the ttHMultiGFW2 framework;
- To be familiar with framework and modify it to meet our needs;
- Running the framework locally was successful;
- But I still have issues submitting to the grid; and
- In the meantime, I'm working on a truth samples[①] to decide a relevant event selections;
- You can use TruthLevelStudies framework to get small ntuple as these samples are DAOD's.

[①] Can be found here: /afs/cern.ch/user/x/xiaozhon/work/public/samples

Progress of the $HH \rightarrow 4\ell$ analysis

Kinematics distributions





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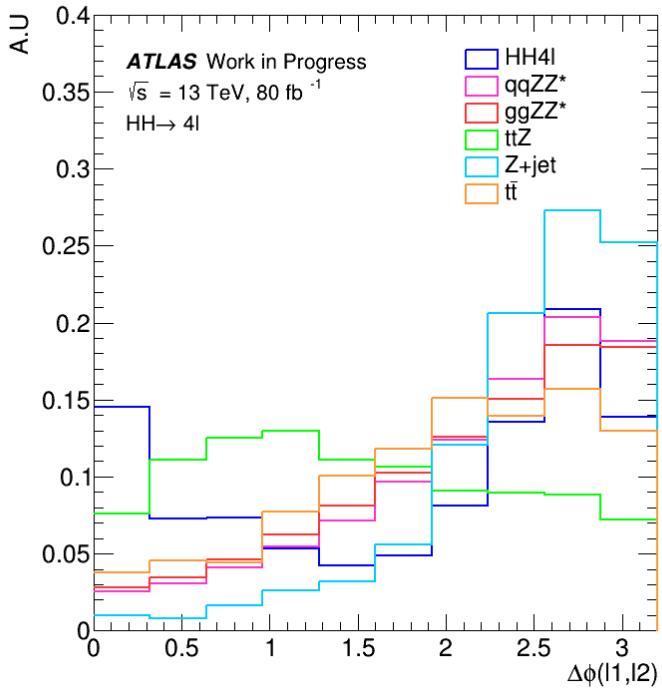

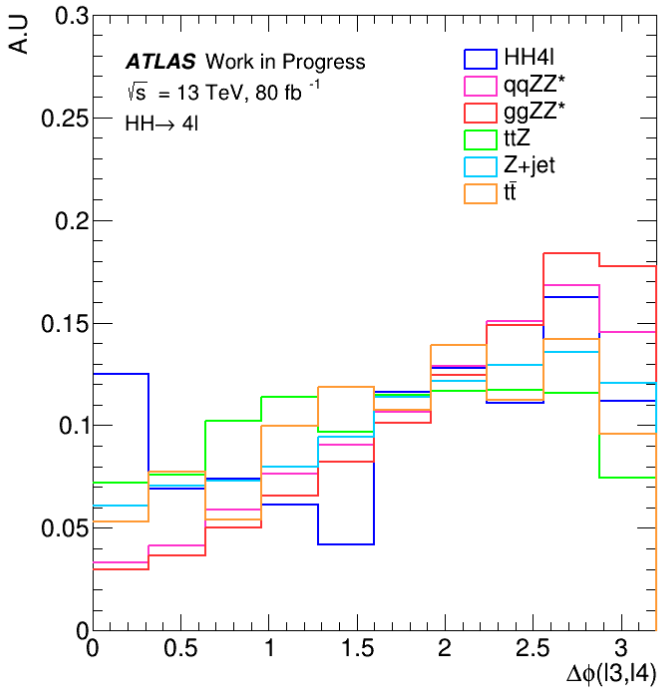

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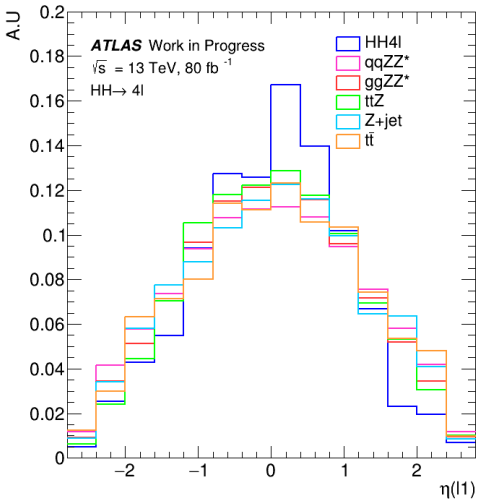

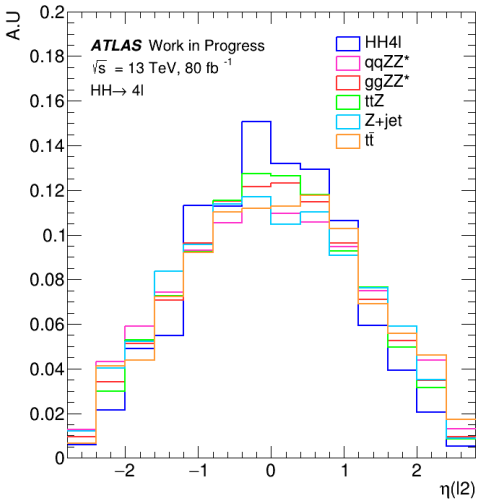

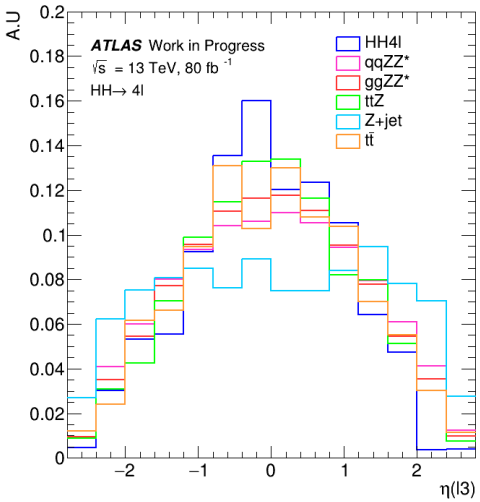

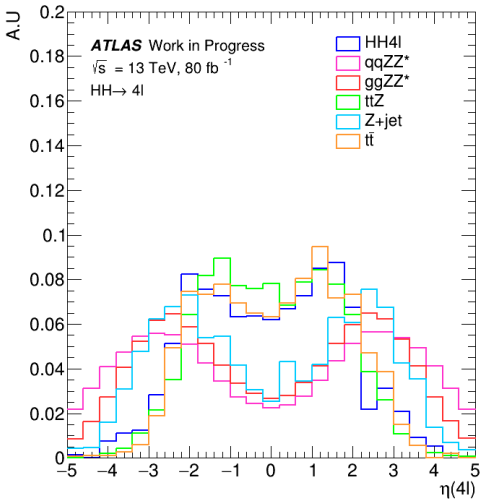

Progress of the $HH \rightarrow 4\ell$ analysis

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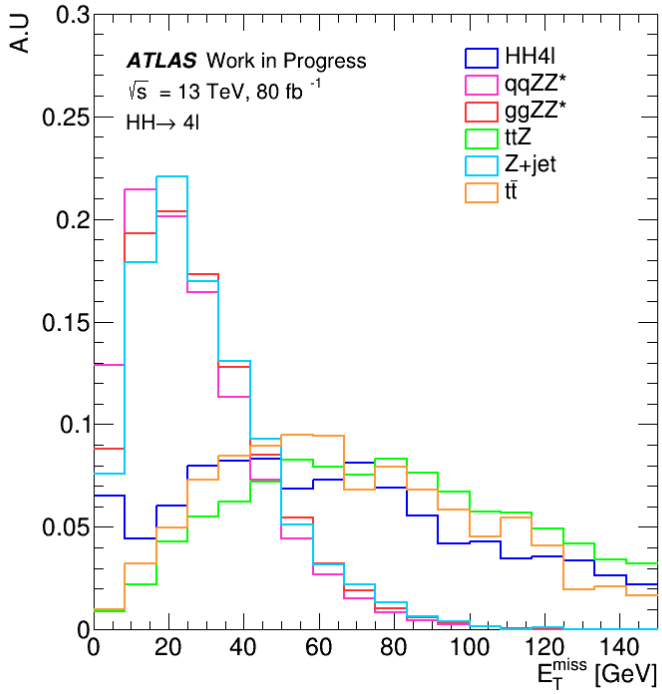

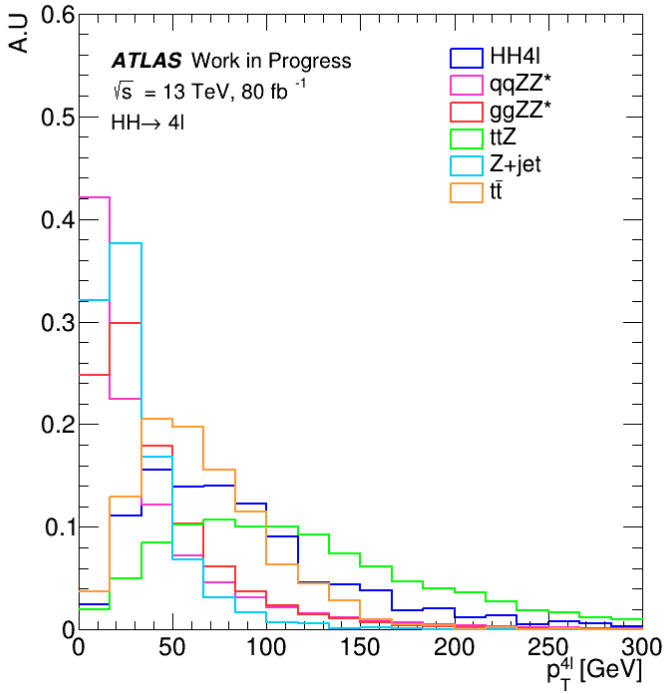

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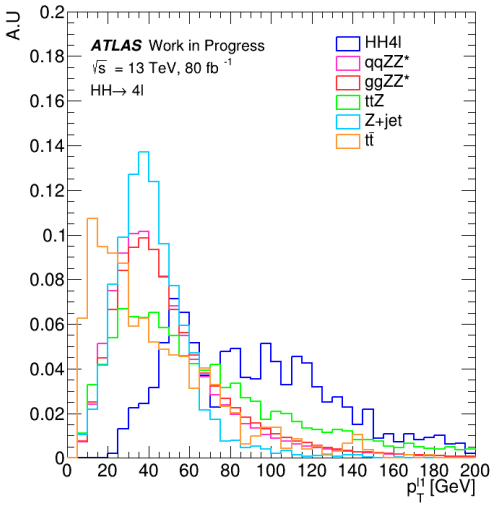
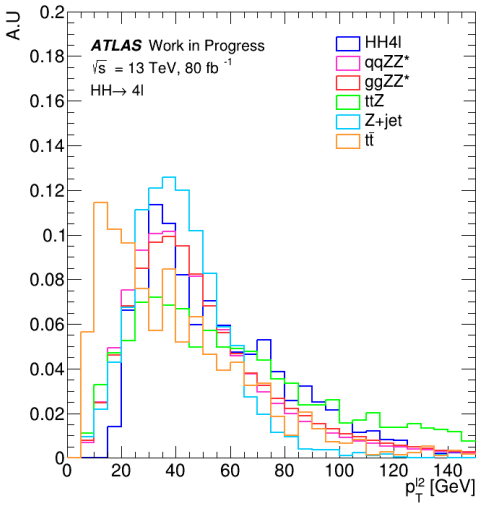
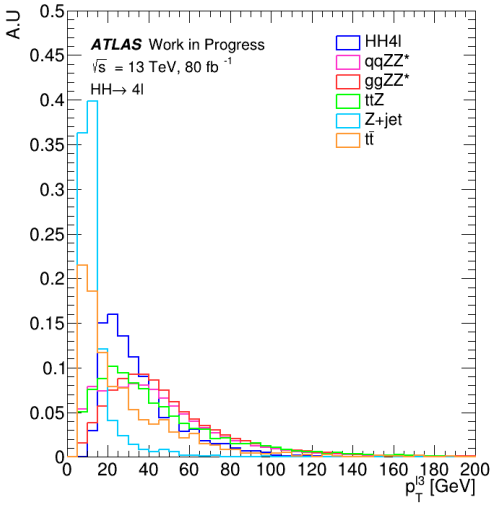
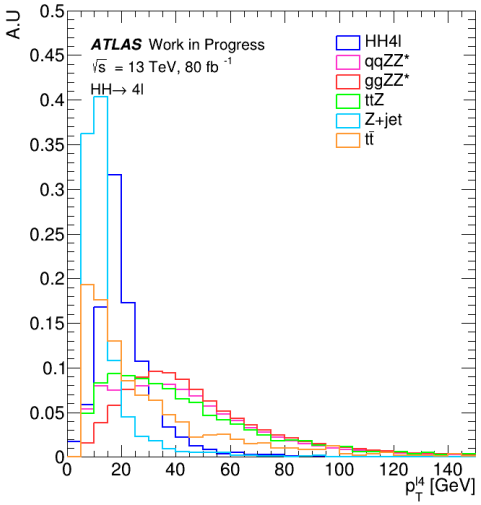
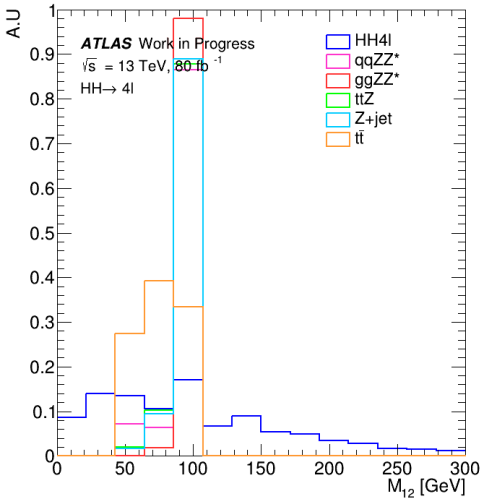
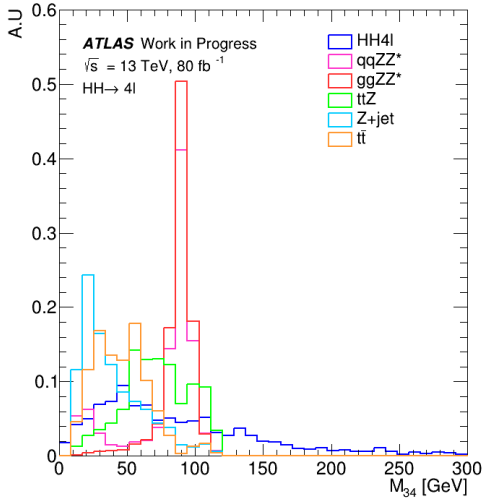
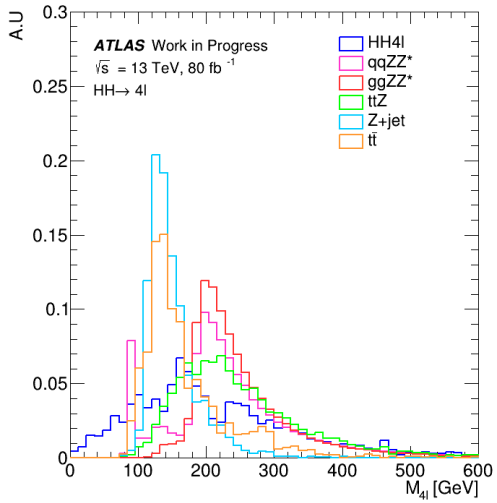








Progress of the $HH \to 4\ell$ analysis

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