Trilinear re-weighted event generation

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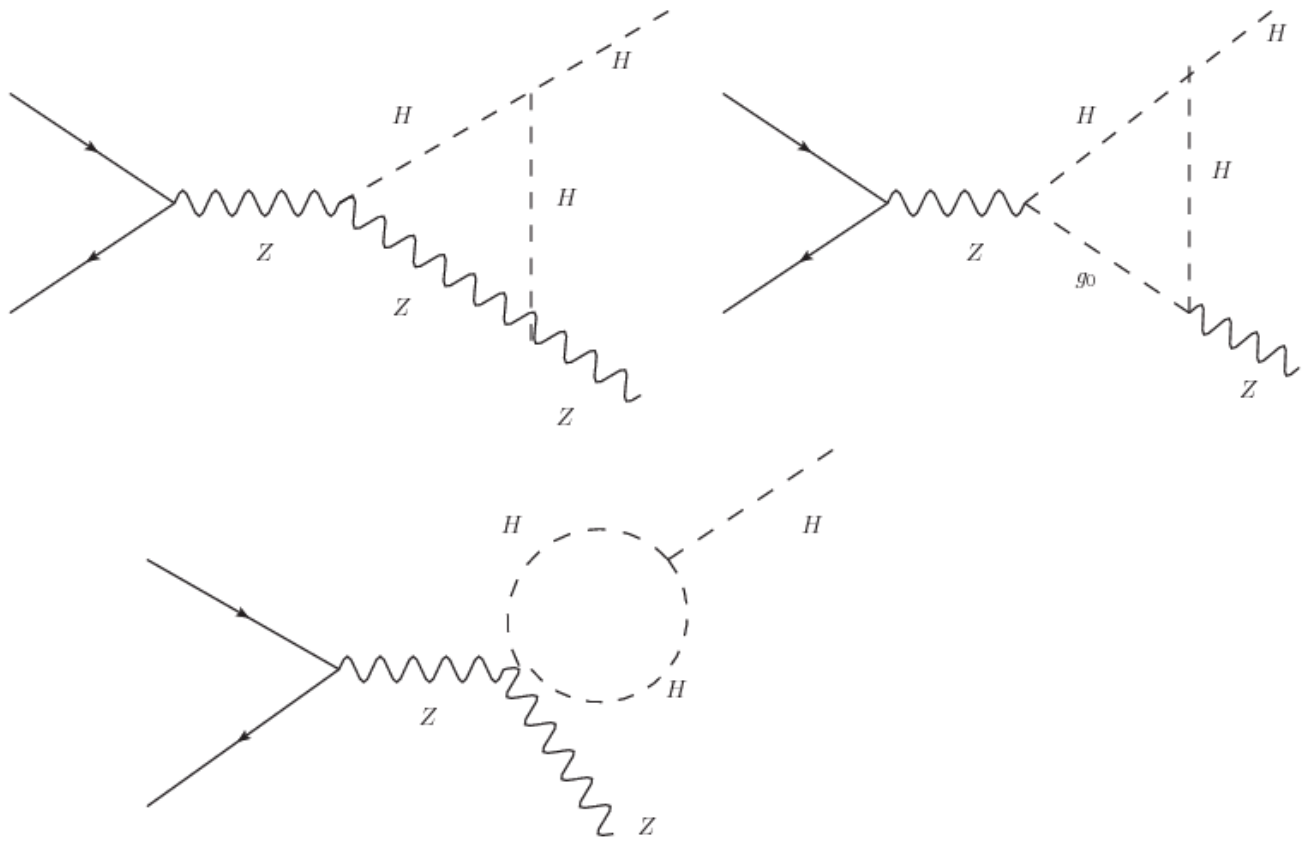
Tri-linear re-weighted event generation

- Attempting to reproduce plots given in arXiv:1709.08649 concerning λ_{HHH} via single-Higgs.
- Have downloaded relevant code from authors page: https://cp3.irmp.ucl.ac.be/projects/madgraph/wiki/HiggsSelfCoupling and managed to generate the original and re-weighted events (.lhe format) for ZH production.



Tri-linear re-weighted event generation

- Requires MG5_aMC_v2_5_5 which can be found in `/vols/cms/heptools/mg5/v2.5.5/MG5_aMC_v2_5_5` along with Pythia and Delphes
- Generated event files are purely at partonic level.
- Require fully reconstructed physics objects in events for analysis so partonic level is not enough.
- How to deal with .lhe event files? MadAnalysis is an option but not ideal for our analysis. Trying to run through Pythia and Delphes but a few bugs in configuration of files.
- Been in frequent contact with authors of the code, and very willing to help!

Next steps

- Successfully run reweighted and original events through PYTHIA and DELPHES. Then will have .root file containing all objects and relevant info.
- From this will attempt to reproduce the plots given in arXiv:1709.08649 w.r.t. ZH production.
- If successful, will repeat steps with VBF and ttH generation specific to $H \to \gamma\gamma$ channel.
- Then have access to MC event samples w/ tri-linear re-weighting.