Update: Trilinear reweighting

Jonathon Langford

Imperial College London

IC Hgg
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Status

- Maldini: determine λ_3 via single-Higgs differential measurements.
- Comparing LO to $\mathcal{O}(\lambda_3)$, observing effect of λ_3 on differential dist. Using code by authors of arXiv:1709.08649 to generate event w/ and w/o trilinear reweighting (inclusion of electroweak loops).
- **Recap**...
  - ▶ Successfully generated events using MADGRAPH for ZH production. In .lhe format, required .root for analysis (chain to run through PYTHIA and DELPHES.
  - ▶ Issue of inclusive Higgs decay: could not include heft model in event gen.
- **Update**...
  - ▶ Events now ran through PYTHIA & DELPHES (.lhe $\rightarrow$ .hepmc $\rightarrow$ .root), using the CMS card.
  - ▶ Changed PYTHIA config file: Higgs has only one decay mode to $\gamma\gamma$ with 100% B.R
  - ▶ In final .root files access to all different branches: GenParticles, GenJets, Photons, Electrons etc

First plot

- Using GenParticles: extract generator level Higgs using PID, plot $p_T(H)$ spectrum for LO and $\mathcal{O}(\lambda_3)$.
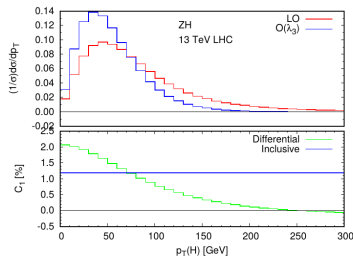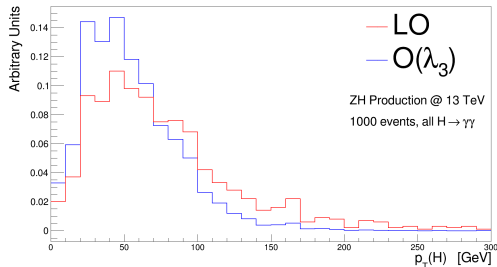
- **Plan**...
  - ▶ Mimic real analysis: Use Gen. level photons w/ p_T + isolation cuts.
  - ▶ Currently inclusive for Z decay: try for ZHLeptonic.
  - ▶ Are we still sensitive to differences in LO and $\mathcal{O}(\lambda_3)$ distributions?
  - ▶ Other plots to make: $p_T(Z)$, $p_T(l)$, m_{ZH}, (VBF) m_{jj}, (ttH) m_{ttH} etc
  - ▶ Locate C_1 variable in authors code. Modifies trilinear coupling. See how changing coupling affects distributions?