Initial Truth Level Studies

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Weekly Analysis Meeting
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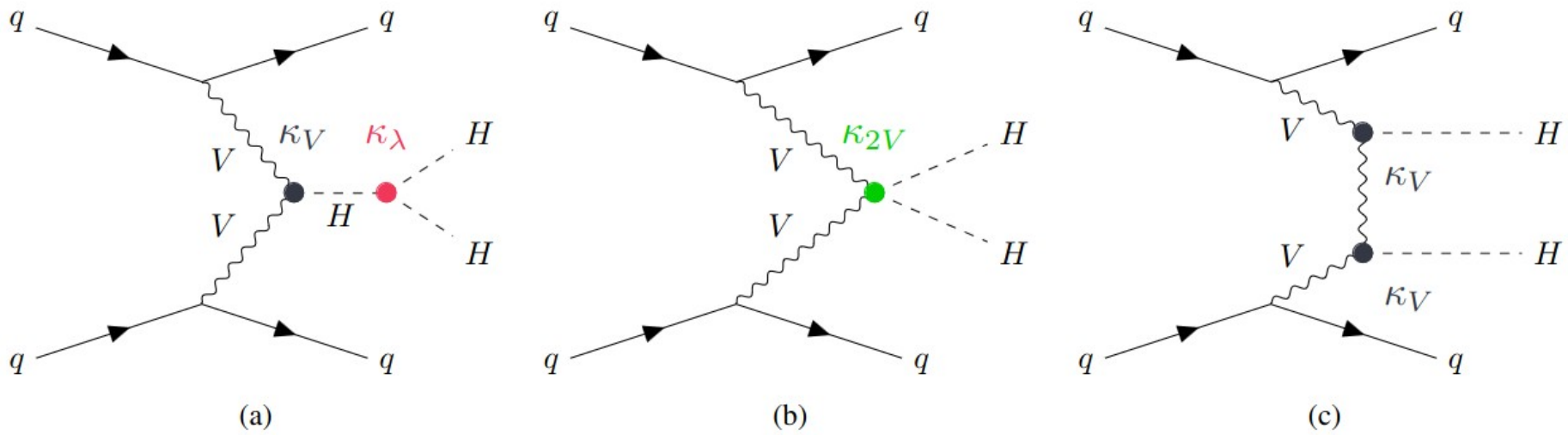
Introduction

- Truth samples for boosted VBF DiHiggs production with single lepton bbWW decay channel
- Several variations for couplings κ_λ, κ_V and κ_{2V} for comparison

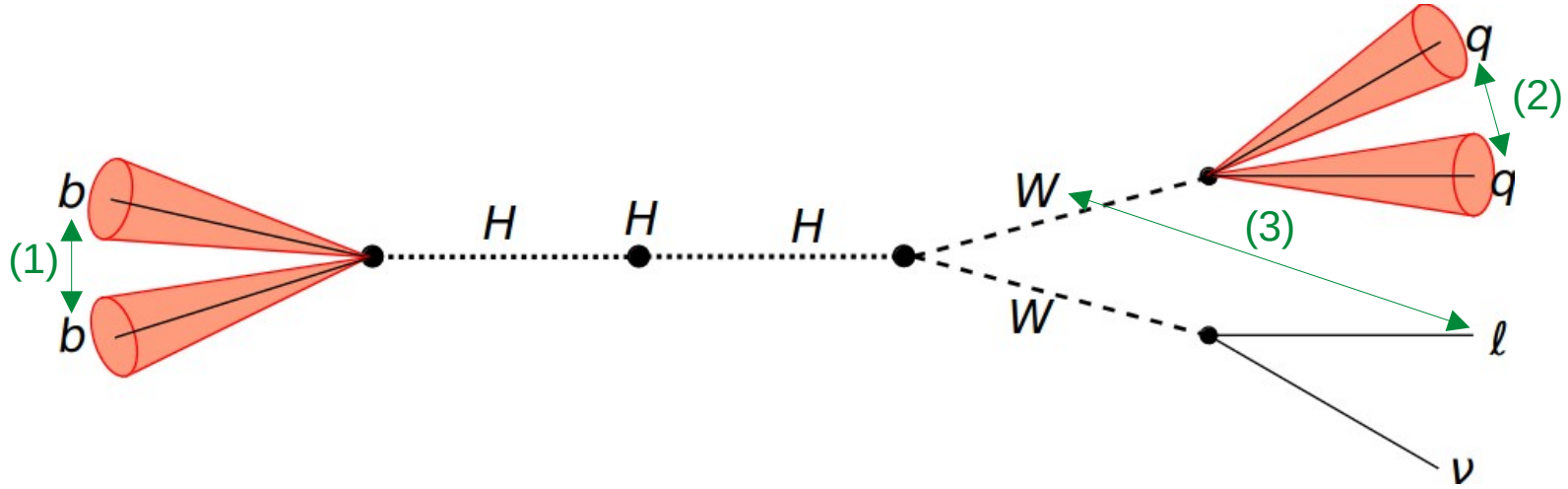


Topology Study

- How common is the boosted topology for the different coupling values?

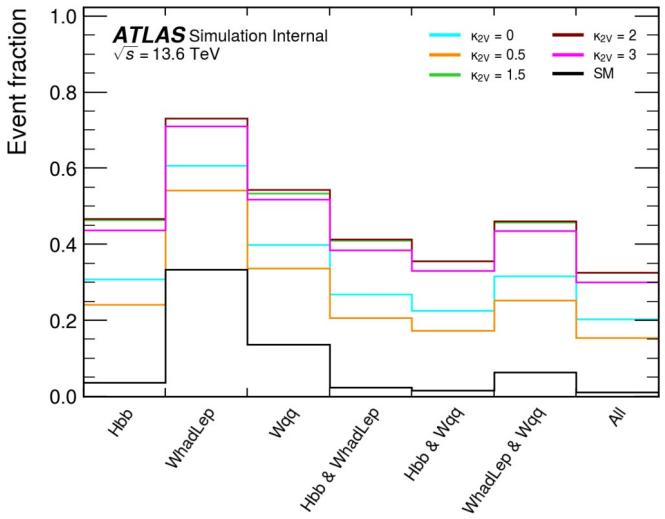
  → Check the fraction of events where final state objects are close to each other (dR < 1)

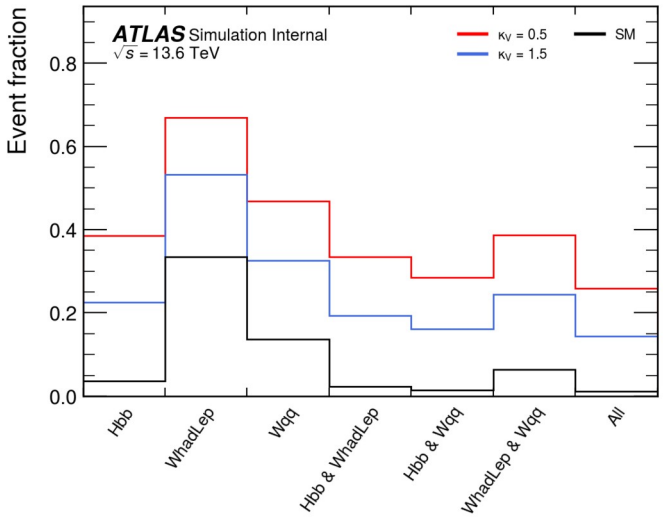
- Check distance for Hbb (1), Wqq (2) and WhadLep (3)

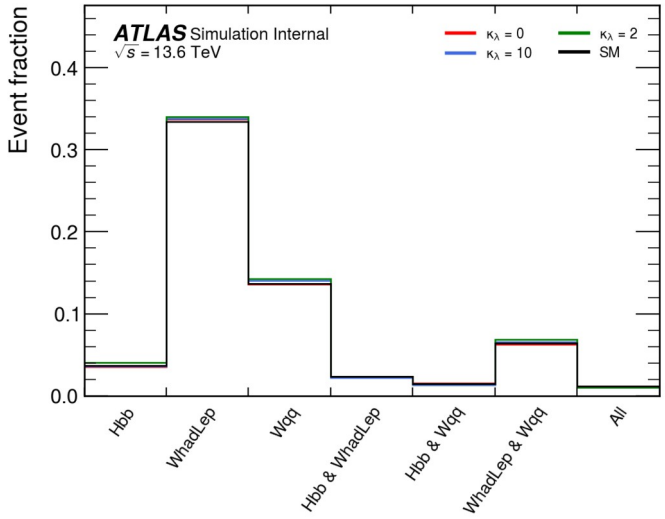


Topology Study

- Boosted topology is sensitive to variations in κ_V and κ_{2V}
- Not really sensitive to SM values or variations of κ_λ

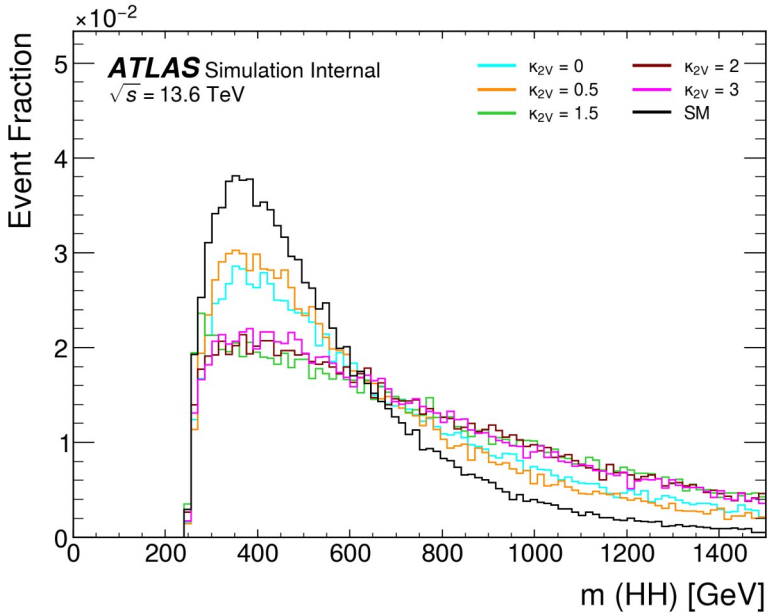


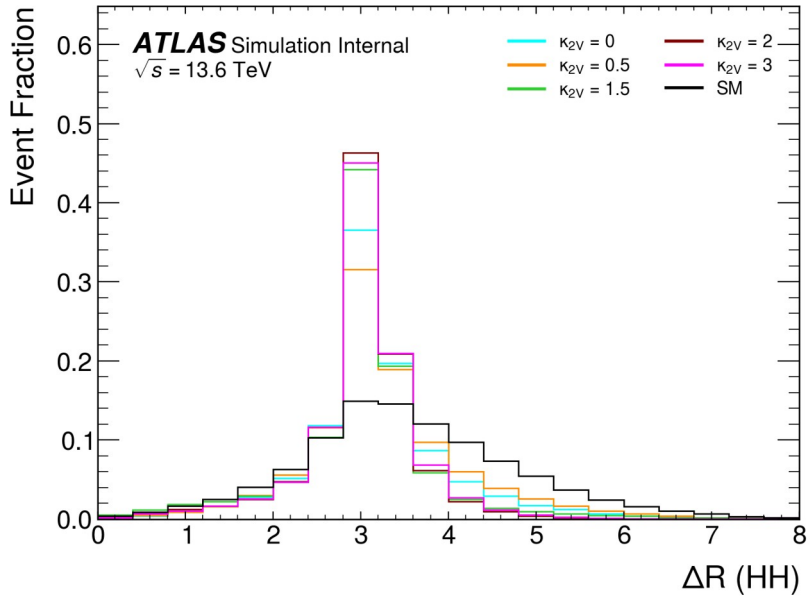




Variables of Interest Study

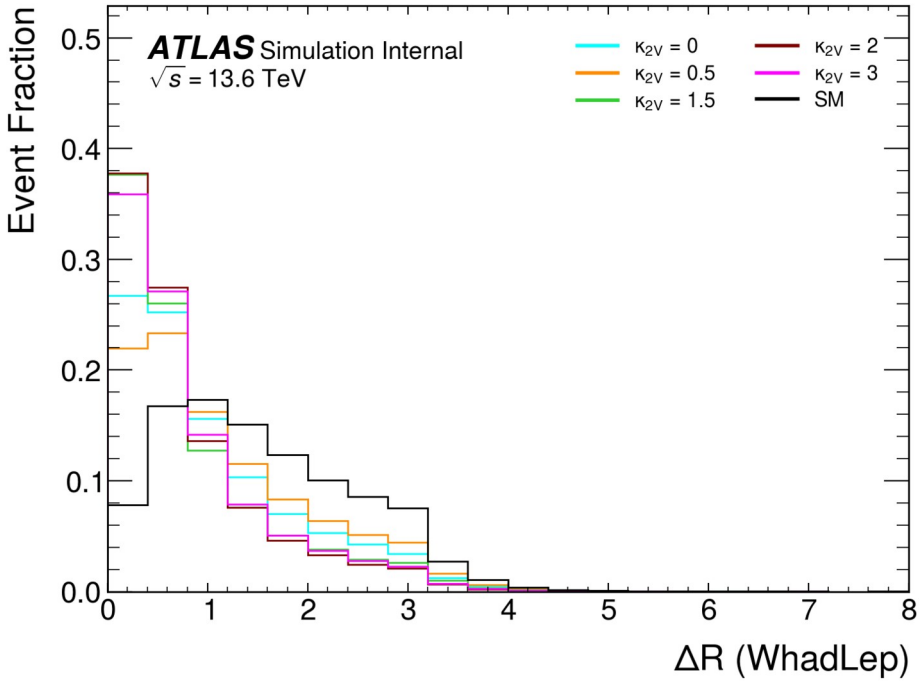
- Search for interesting variables for separating different coupling values
- Examples in the following for the HHVV coupling parameter κ_{2V}

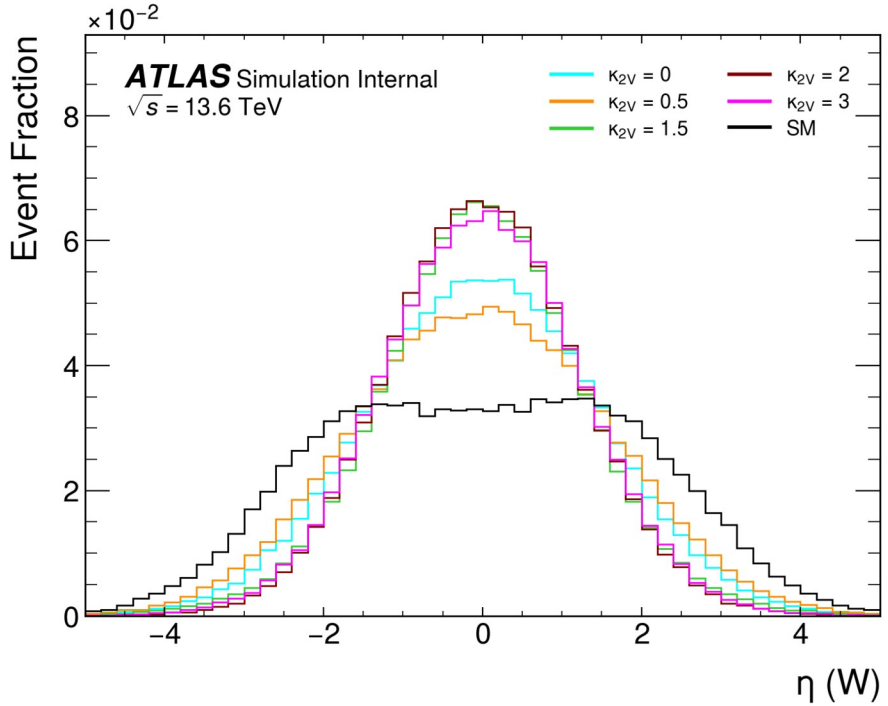




Variables of Interest Study

- Difference in boost are also visible in some variables





Conclusions

- Conducted a topology study on truth samples
- Differences in boosted topologies makes analysis sensitive to non-SM coupling values
- These differences are also visible in some variables

  → These variables can be considered for analyzing reconstructed samples

Backup