

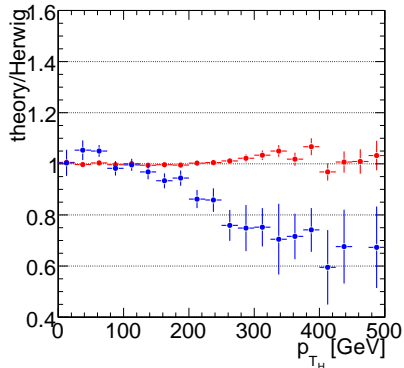
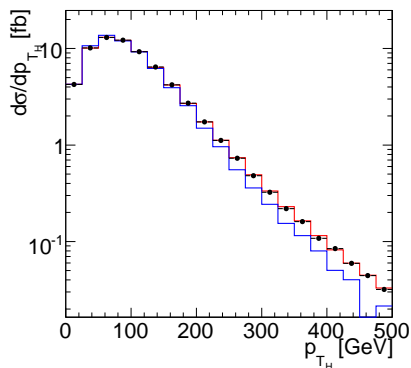
Setup

- ▶ Higgs Production by Vector Boson Fusion (VBF)
- ▶ EW+QCD corrections calculated in Phys. Rev. D77: 013002,2008 (Ciccoline, Denner, Dittmaier)
- ▶ Also differential distributions
- ▶ Got the code from Stefan
- ▶ Try to see differences to Herwig PS-Generator, perhaps reweighting procedure to get differential distributions agree better with NLO?
- ▶ In the following $M_H = 120 \text{ GeV}$, $\sqrt{s} = 14 \text{ TeV}$.
- ▶ Rather low statistics for NLO distributions at the moment, will take some days to get this improved.

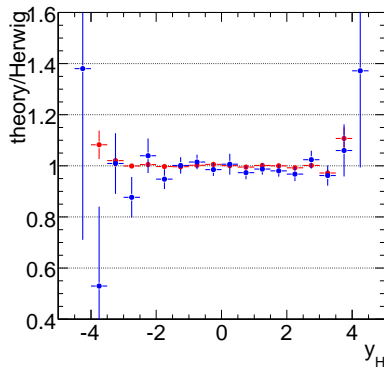
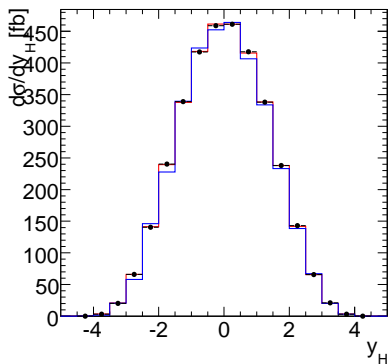
Cross sections

- ▶ k_T jets, made from all partons (CDD) or hadrons (Herwig, Rivet analysis) within $|y| < 5$
- ▶ All jets $p_T > 20$ GeV, $|y| < 4.5$
- ▶ VBF cuts:
 - ▶ Leading two jets in opposite hemispheres and with a rapidity separation of at least 4
- ▶ Herwig 6.510 with CTEQ6L1: $\sigma_{\text{qqH}} = 1549.4$ fb
- ▶ CDD in leading order with CTEQ6L1: $\sigma_{\text{qqH}} = 1686.2$ fb
- ▶ Different scale choice?
- ▶ In the following normalize Herwig to CDD LO cross section
- ▶ CDD in NLO (EW+QCD) with MRST2004QED:
 $\sigma_{\text{qqH}} = 1664.2$ fb
- ▶ BUT: Differential distributions also important!

 Herwig Hadron Level
  Born
  Full: EW+QCD



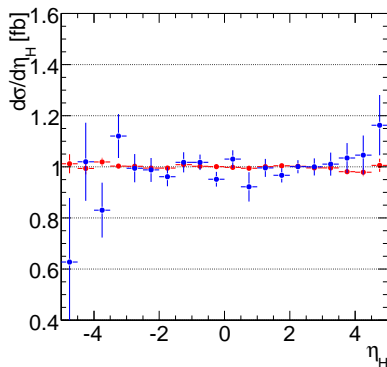
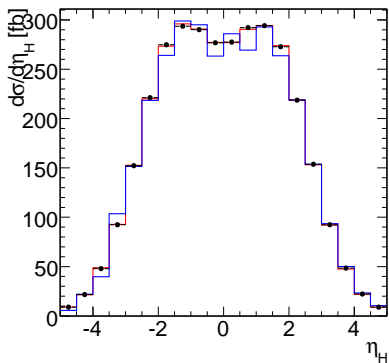
Herwig Hadron Level Born Full: EW+QCD



 Herwig Hadron Level

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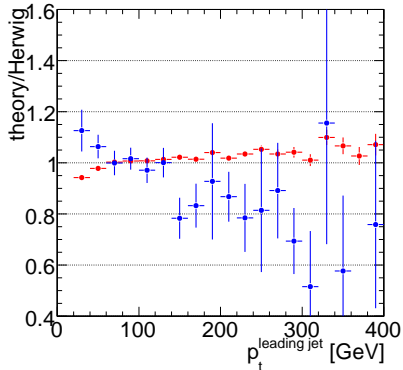
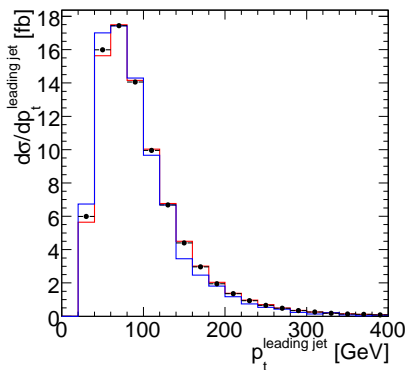
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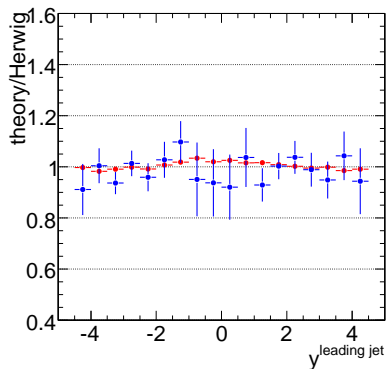
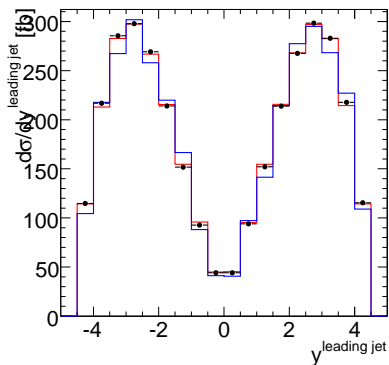
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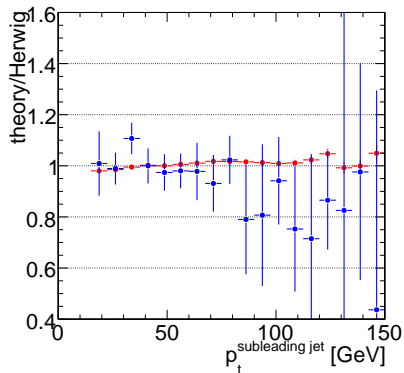
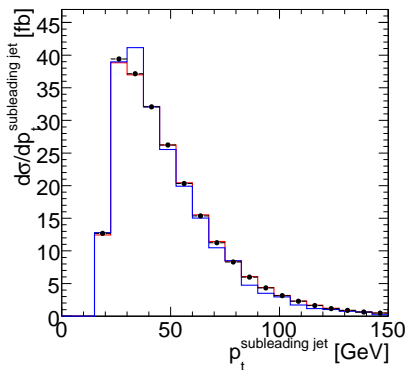
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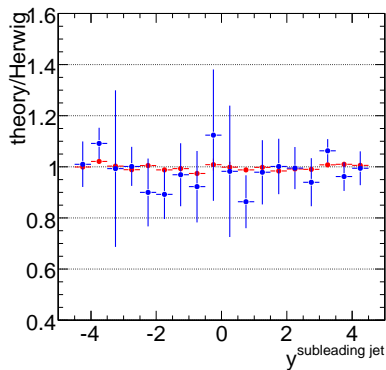
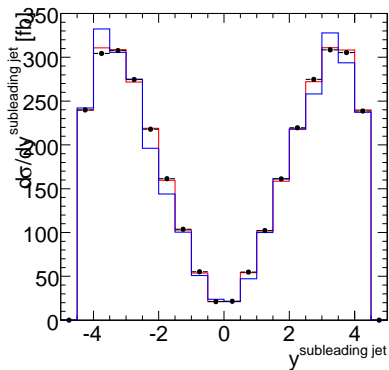
Herwig Hadron Level Born Full: EW+QCD



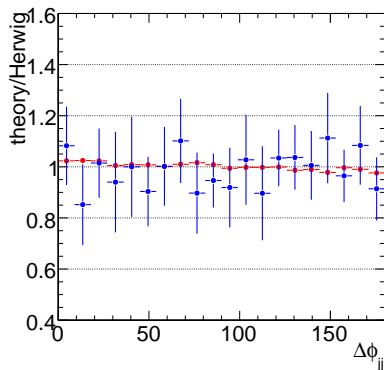
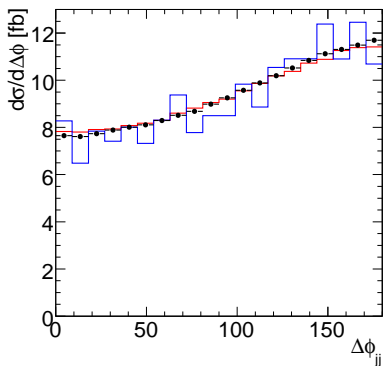
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Herwig Hadron Level Born Full: EW+QCD



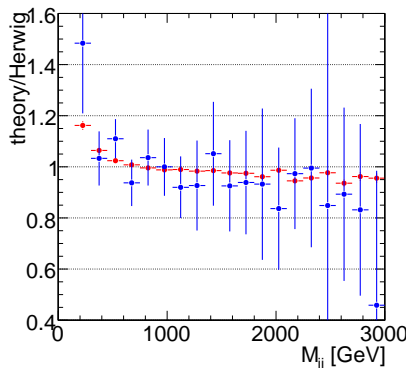
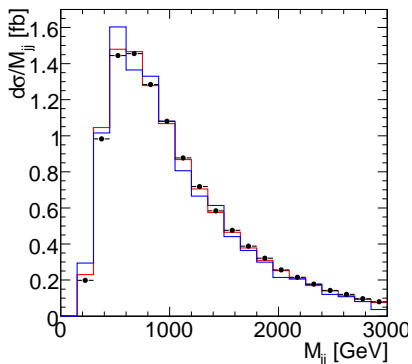
Herwig Hadron Level Born Full: EW+QCD



 Herwig Hadron Level

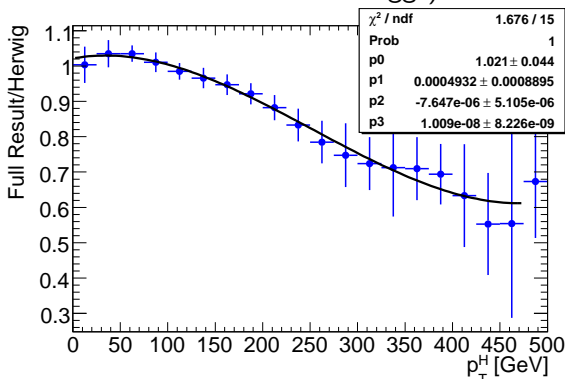
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Reweighting in p_T^H

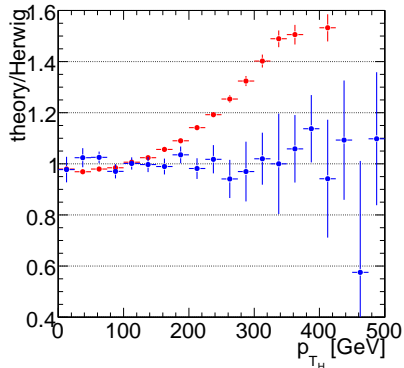
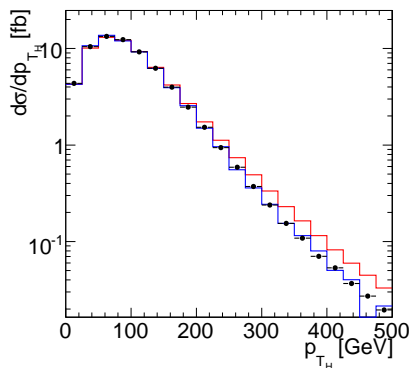
- ▶ Variable that differs most between LO and NLO
- ▶ Might be that other distributions get better as well (e.g. transverse momenta of tagging jets are correlated with transverse momentum of the Higgs)



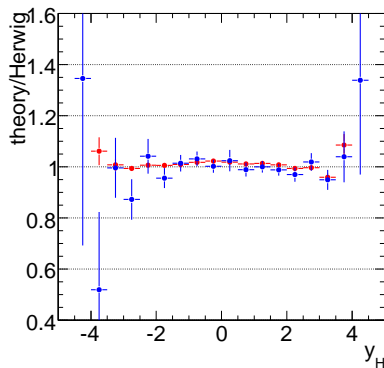
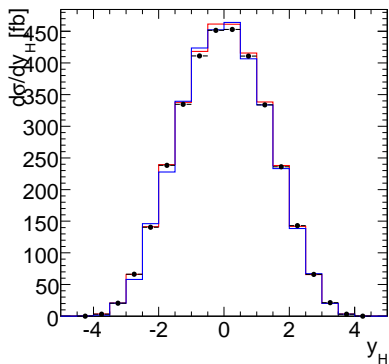
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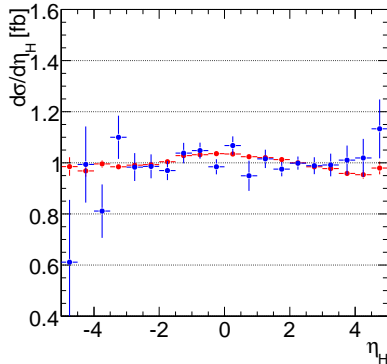
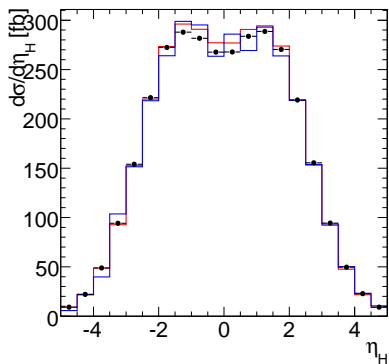
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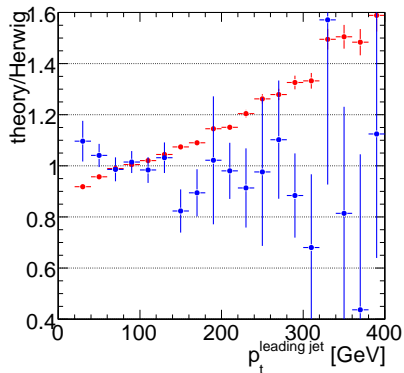
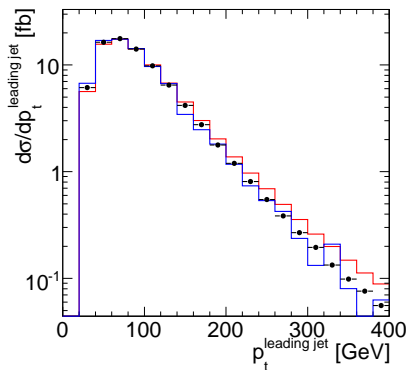
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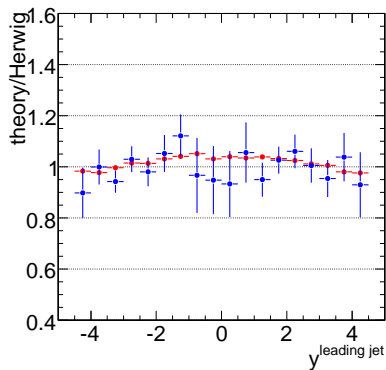
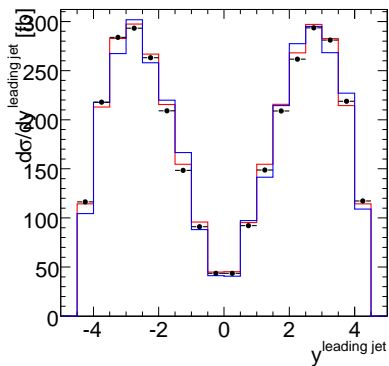
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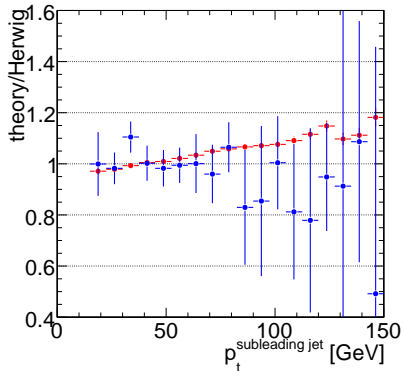
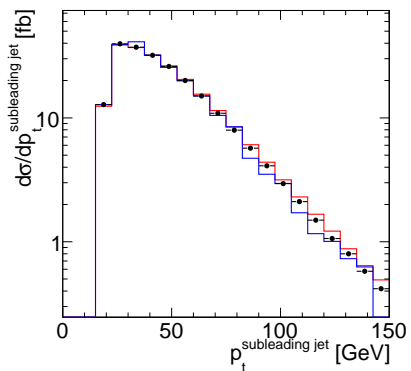
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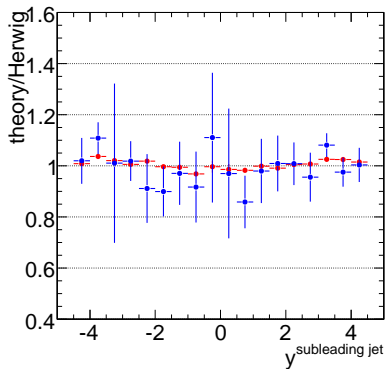
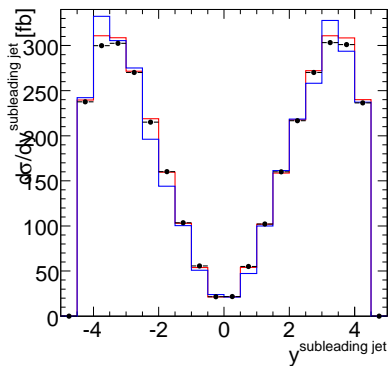
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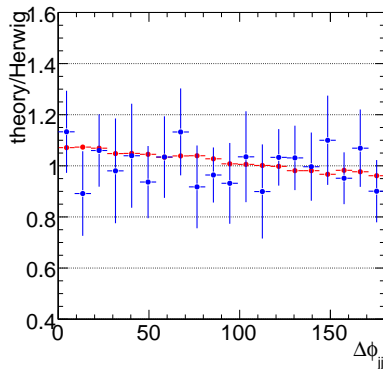
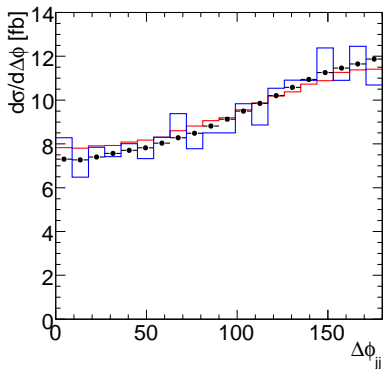
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 Herwig Hadron Level


 Born


 Full: EW+QCD



 Herwig Hadron Level
  Born
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