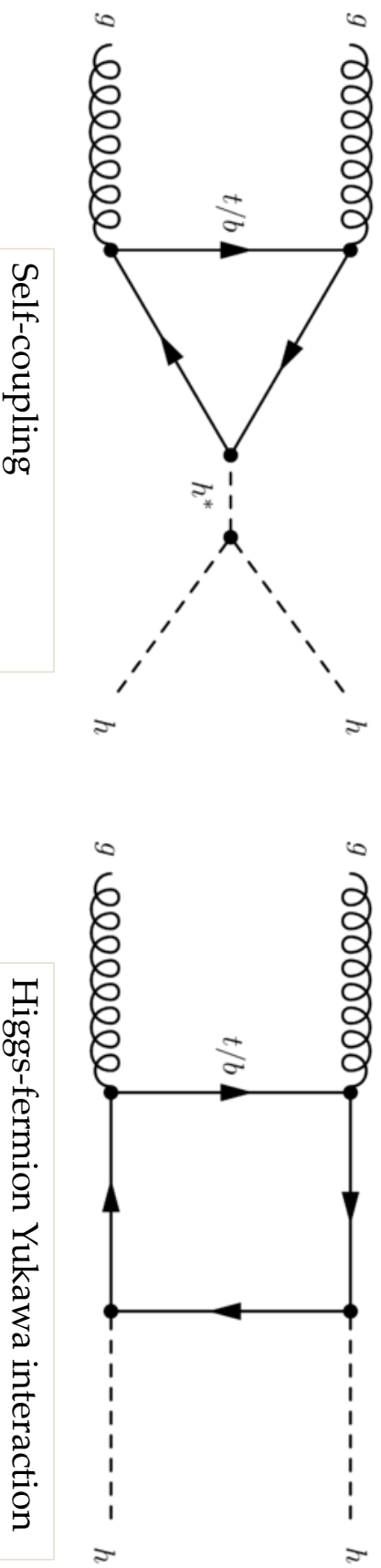# HH->4b project summary

for PHYS 8361

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Introduction

The existence of Higgs boson is a consequence of electroweak symmetry breaking with the SM

It predicts self-coupling between Higgs bosons

The measurement of the self-coupling is used to test the mechanism of EWSB

Self-coupling

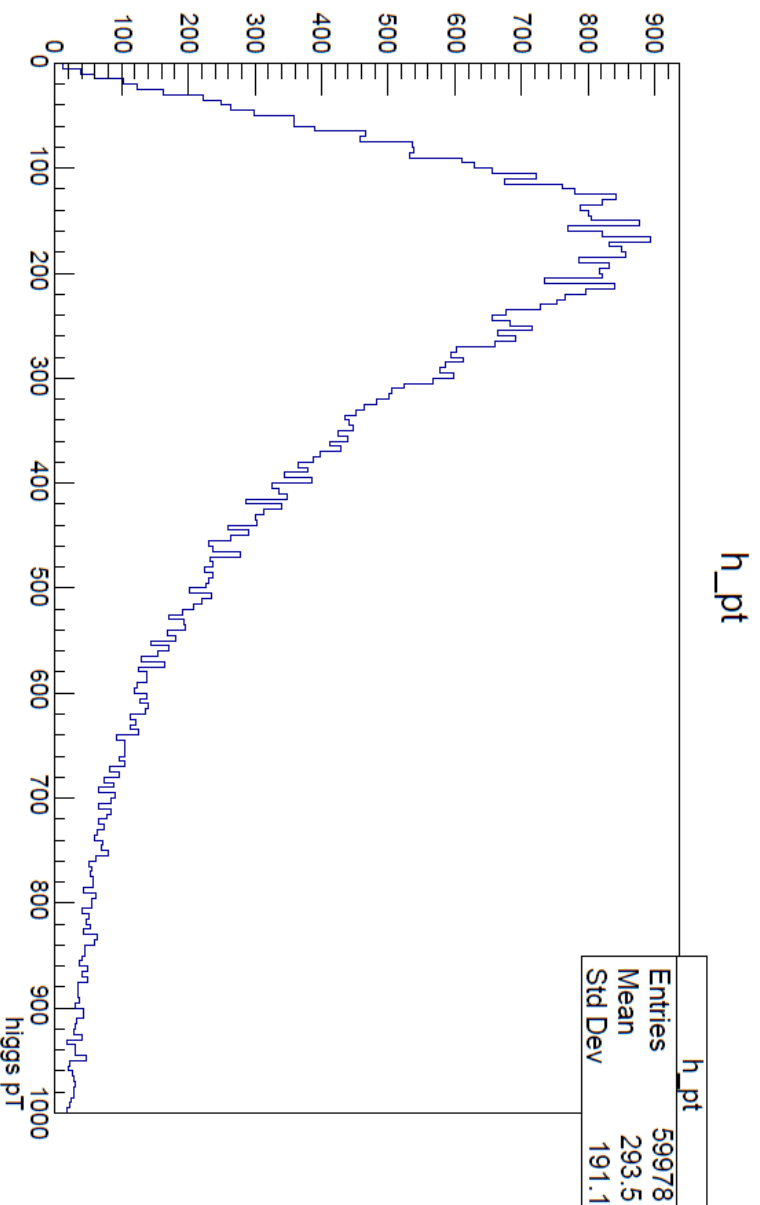Higgs-fermion Yukawa interaction

MC generator:

NLO SM di-Higgs

MC sample:

mc15_13TeV.342619.aMcAtNloHerwigppEvtGen_UEEE5_CTEQ6L1_CT1
0ME_hh_4b.merge.DAOD_EXOT8.e4419_s2608_r6869_r6282_p2438
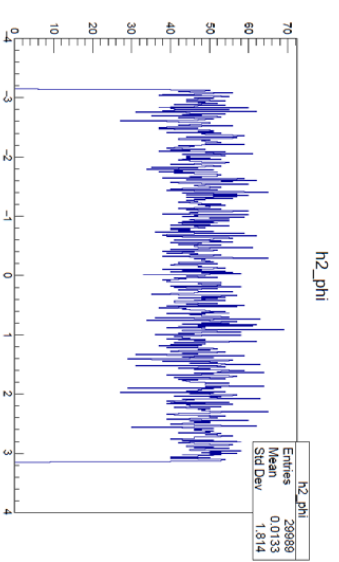
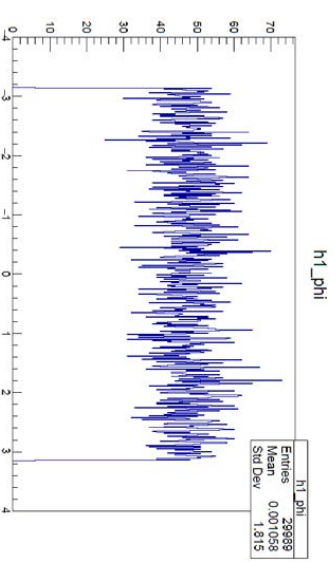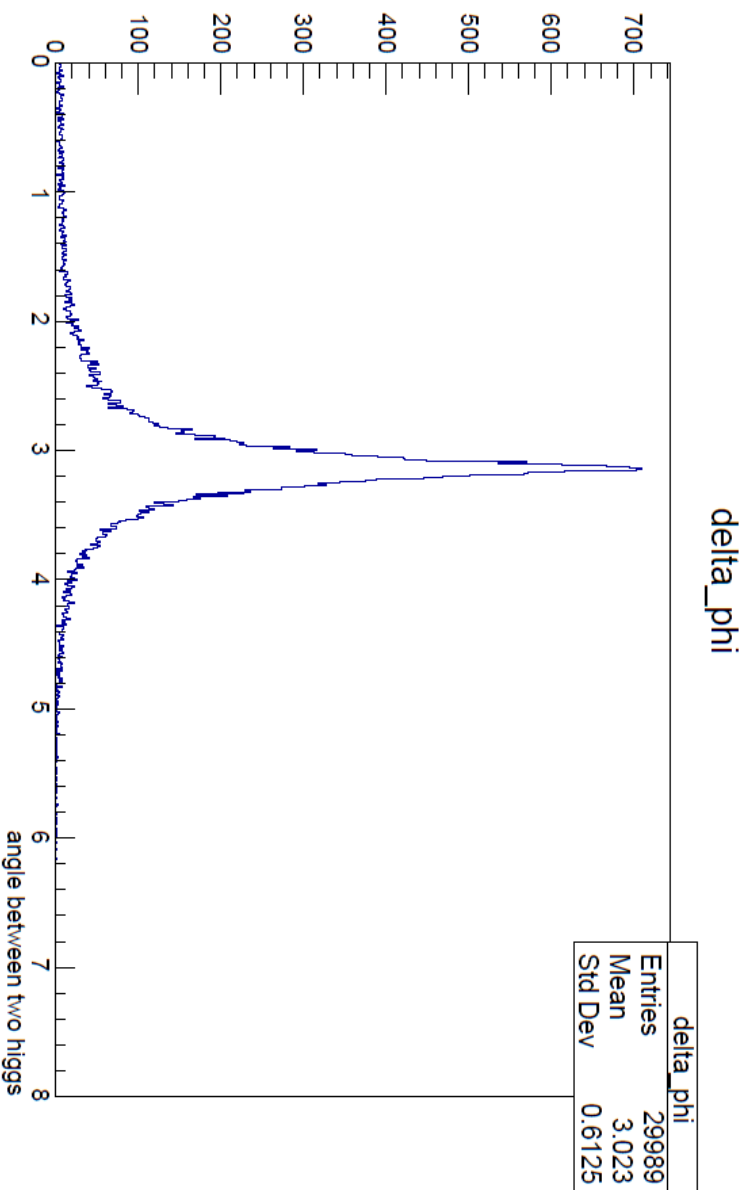(30000 events run in this project)

Selection:

1. check whether it is higgs

2. check whether its children are b and b-bar

3. if yes, record this particle

3. if two higgs found, check whether from the same vertex

4. if yes, plot the pT and phi

Higgs transverse momentum

h_pt

h_pt	
Entries	59978
Mean	293.5
Std Dev	191.1

higgs pT

Angle between two Higgs

delta_phi

delta_phi	
Entries	29989
Mean	3.023
Std Dev	0.6125

angle between two higgs

h1_phi	
Entries	29989
Mean	0.001058
Std Dev	1.815

h1_phi

h2_phi	
Entries	29989
Mean	0.0133
Std Dev	1.814

h2_phi

The End