Weekly report

FANGYI GUO

VBF Higgs CP test

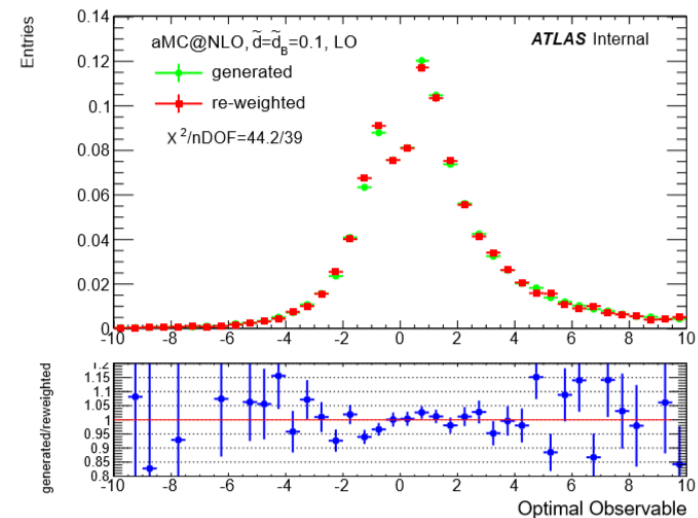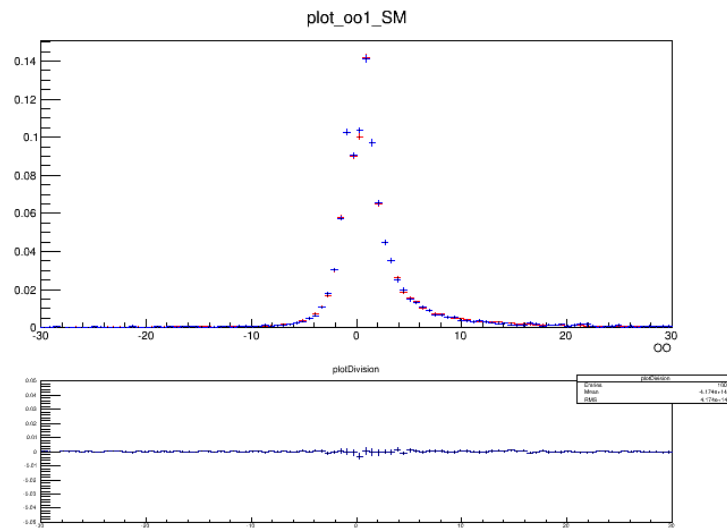HAWK validation:

- Generated 2 truth MC with Madgraph_aMC@NLO:

  1) SM VBF: p p > h j j $$ w+ w- z a QCD=0, default pars.

  2) CP-mixing VBF: same syntax but changed the coupling pars:

MG5_aMC@NLO parameters numerical values, $\tilde{d} = \tilde{d}_B = 0.1$
$c_\alpha = 0.6$
$K_{SM} = 1.\bar{6}$
$k_{AWW} = -2.03$
$k_{AZZ} = -2.03$
$k_{A\gamma\gamma} = -155.97$
$k_{AZ\gamma} = 0$

VBF Higgs CP test

Validation result:

Left: my result, blue is re-weight, red is generated.
Right: result cited from H->tautau supporting note

VBF Higgs CP test

HAWK package debug:

◦ Changed the PDGID from TruthEvent::PDGID to (TruthParticle::status()==21)->PDGID

◦ Saved those ~20% events shows wrong parton flavor

◦ Now about 1.6% events still don't have correct weight: wrong momentum

  u+g->d(560, -24, 81, 554) + c(38, 10, -36, -7) + sbar(402, -7, -27, -401)+H(192, 22, -18, 14)GeV

  X1 = 0.114, X2 = 0.00771

  Plan to abandon them.

Ongoing:

◦ convert 15 + 16 data to Ntuple, for side-band model check and data-MC comparison.