

Higgs to Invisible MC Comparison

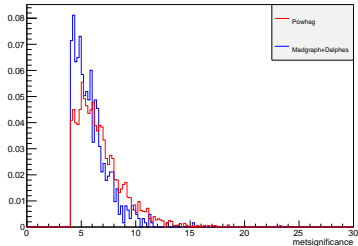
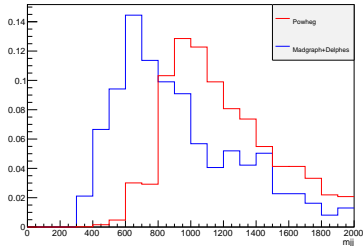
Cut flow

- ▶ Compare yields cut by cut
- ▶ Loosest selection easily available in CMS samples is: $\text{met significance} > 3$, $\Delta\eta_{jj} > 3.6$
 - all selection steps below have this requirement
- ▶ Add cuts one by one
- ▶ Agreement at $\sim 20\%$ until M_{jj} cuts

Cut added	Powheg + CMS yield	Madgraph + Delphes yield
$j_{1p_T} > 50, j_{2p_T} > 45$	1351	1834
$\min\Delta\phi(j, \text{met}) > 2.3$	649	812
$\text{met} > 90$	624	802
$M_{jj} > 1200$	300	194
$\text{met significance} > 4$	273	167

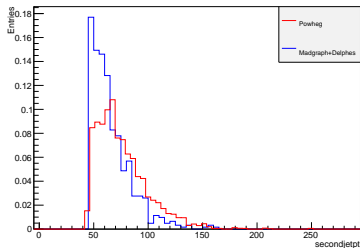
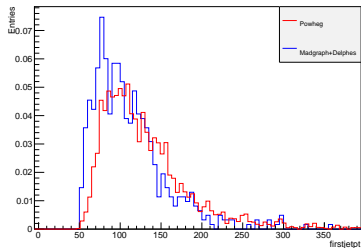
Compare Distributions

- ▶ Selection: $\text{met significance} > 4$, $\Delta\eta_{jj} > 3.6$, $j_1 p_T > 50$, $j_2 p_T > 45$, $\min\Delta\phi(j, \text{met}) > 2.3$, $\text{met} > 90$
- ▶ These two variables were causing biggest cut flow difference before
- ▶ Met significance now seems fairly well modelled



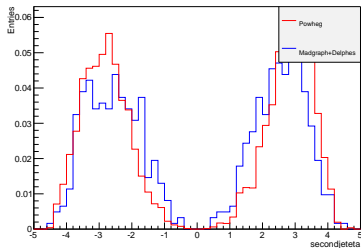
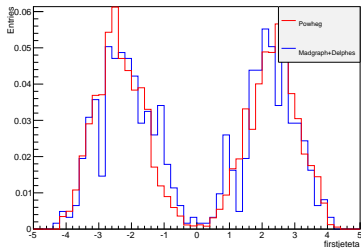
Compare Distributions

- Selection: $\text{met significance} > 3$, $\Delta\eta_{jj} > 3.6$, $j_1 p_T > 50$, $j_2 p_T > 45$, $\min\Delta\phi(j, \text{met}) > 2.3$, $\text{met} > 90$
- Jet pts fairly similar, a little harder in powheg



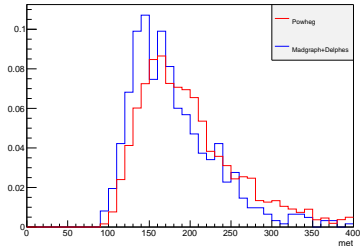
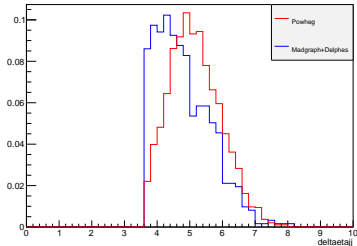
Compare Distributions

- ▶ Selection: $\text{met significance} > 3$, $\Delta\eta_{jj} > 3.6$, $j_1 p_T > 50$, $j_2 p_T > 45$, $\min\Delta\phi(j, \text{met}) > 2.3$, $\text{met} > 90$
- ▶ Madgraph jets more central than powheg



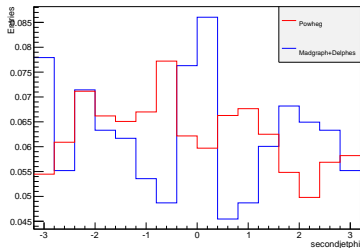
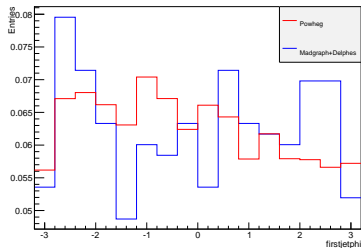
Compare Distributions

- ▶ Selection: $\text{met significance} > 3$, $\Delta\eta_{jj} > 3.6$, $j_1 p_T > 50$, $j_2 p_T > 45$, $\min\Delta\phi(j, \text{met}) > 2.3$, $\text{met} > 90$
- ▶ Again see madgraph jets being more central
- ▶ Met similar between madgraph and powheg



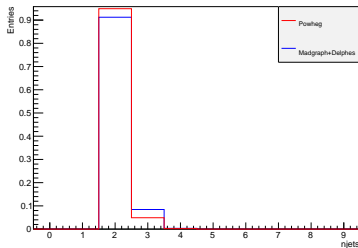
Compare Distributions

- ▶ Selection: $\text{met significance} > 3$, $\Delta\eta_{jj} > 3.6$, $j_1 p_T > 50$, $j_2 p_T > 45$, $\min\Delta\phi(j, \text{met}) > 2.3$, $\text{met} > 90$
- ▶ Limited statistics in phi



Compare Distributions

- ▶ Selection: $\text{met significance} > 3$, $\Delta\eta_{jj} > 3.6$, $j_1 p_T > 50$, $j_2 p_T > 45$, $\min\Delta\phi(j, \text{met}) > 2.3$, $\text{met} > 90$
- ▶ Numbers of jets similar, slightly more additional jets in madgraph



Summary



Backup