



A look at $W(\rightarrow ev) + 2 \text{ jet}$ sample: Reconstructable W Pairs

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Candidate events

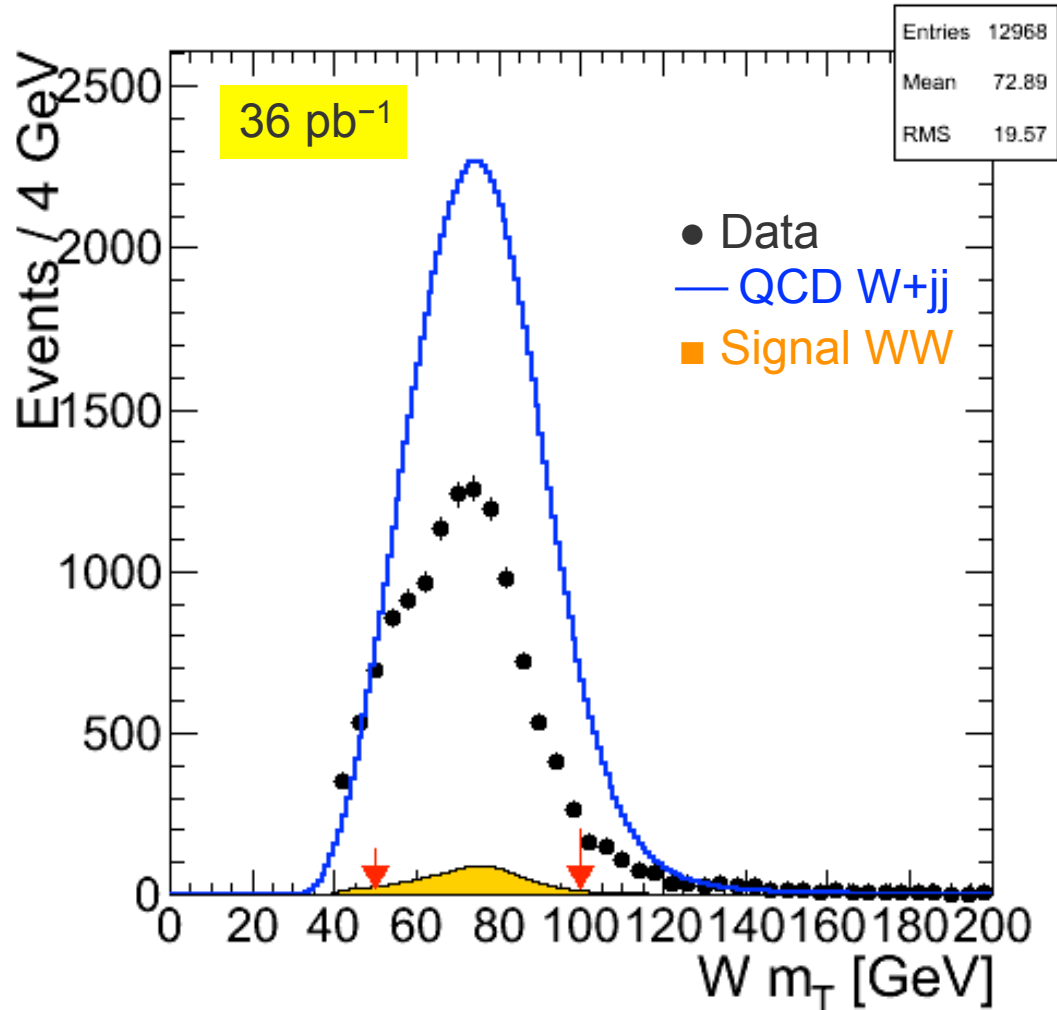


- ◆ $W \rightarrow e\nu$ reconstruction
 - GsfElectron passing tight WP80 criteria
 - Electron $E_T > 25$ GeV
 - PF MET > 20 GeV
 - Transverse mass in range 50–100 GeV
 - Z veto
- ◆ Require exactly two PF jets in the event
 - each jet with corrected $p_T > 20$ GeV and $|\eta| < 2.4$



Cut flow: W transverse mass

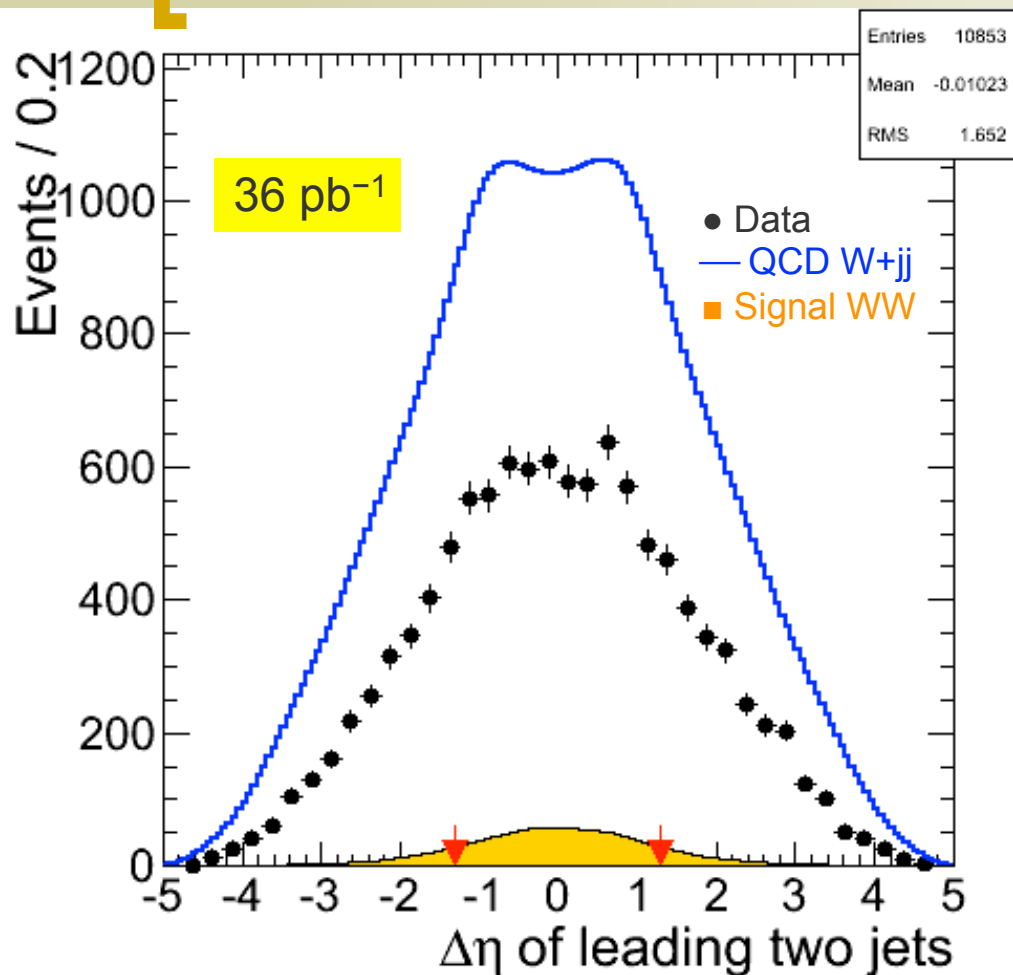
Start with 12968 $W(\rightarrow ev)+jj$ events passing the criteria on last page.
10853 have $50 < W m_T < 100$ GeV



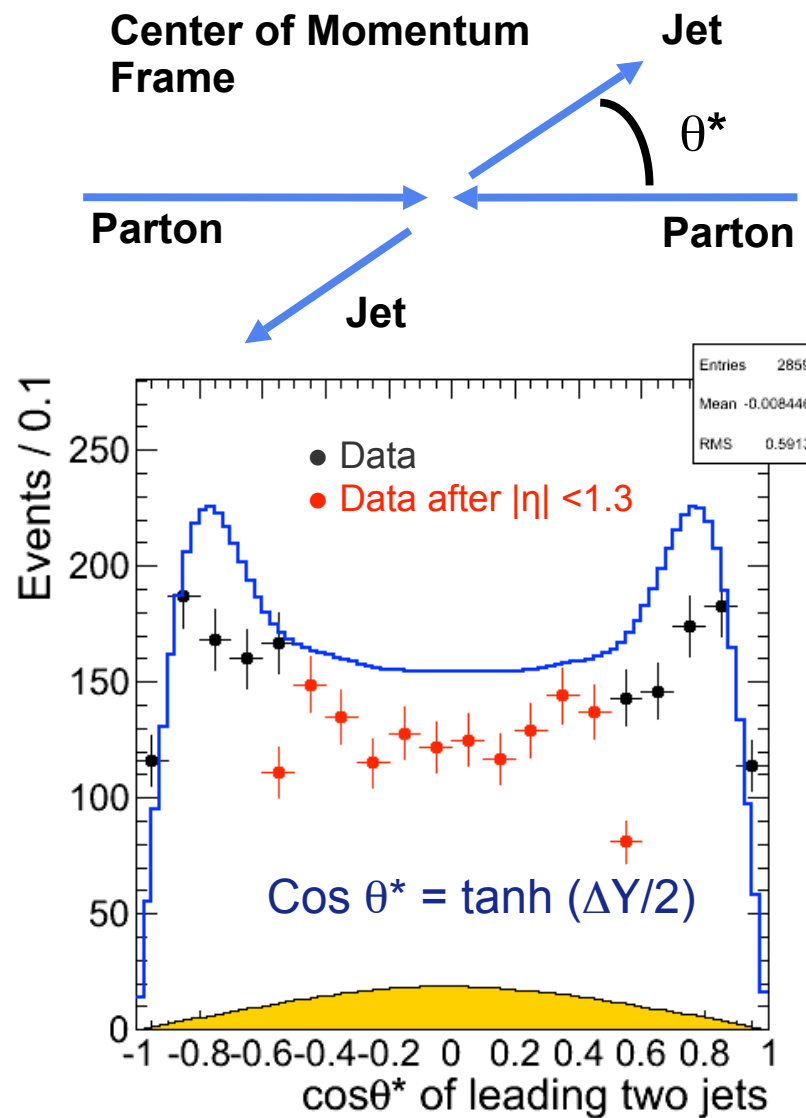
$$m_T = \sqrt{2E_T(e) \cdot mE_T \cdot (1 - \cos(\Delta\phi_e, mE_T))}$$



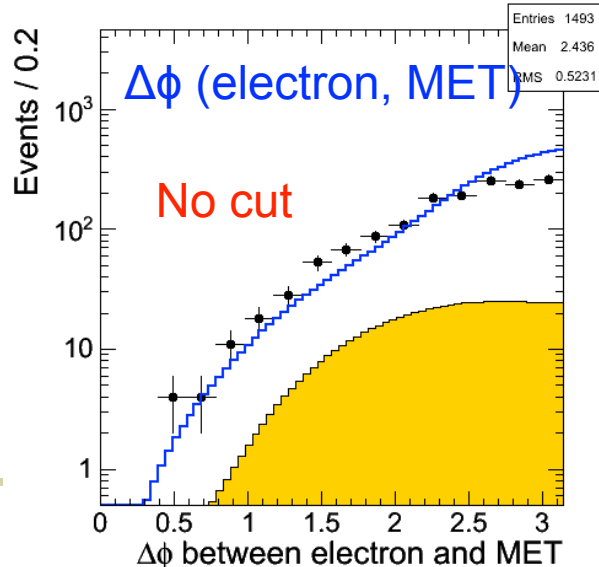
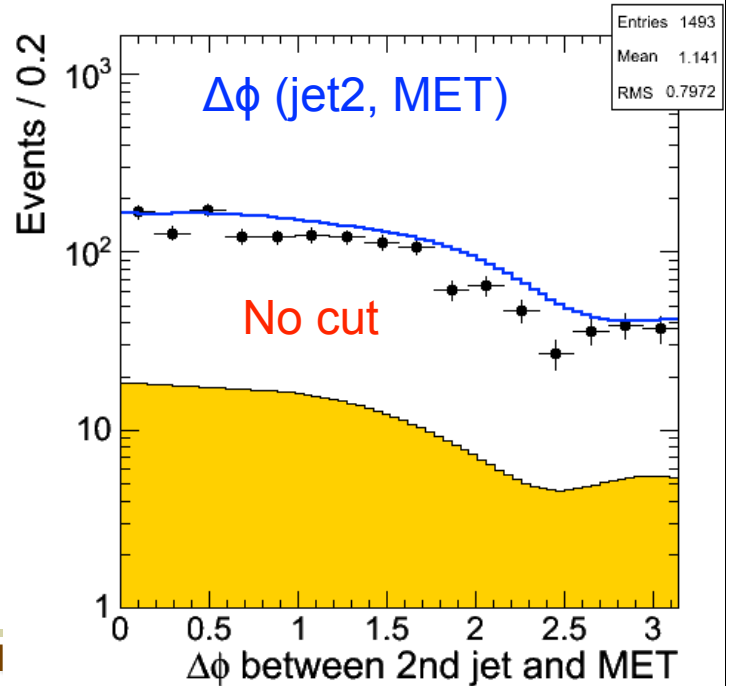
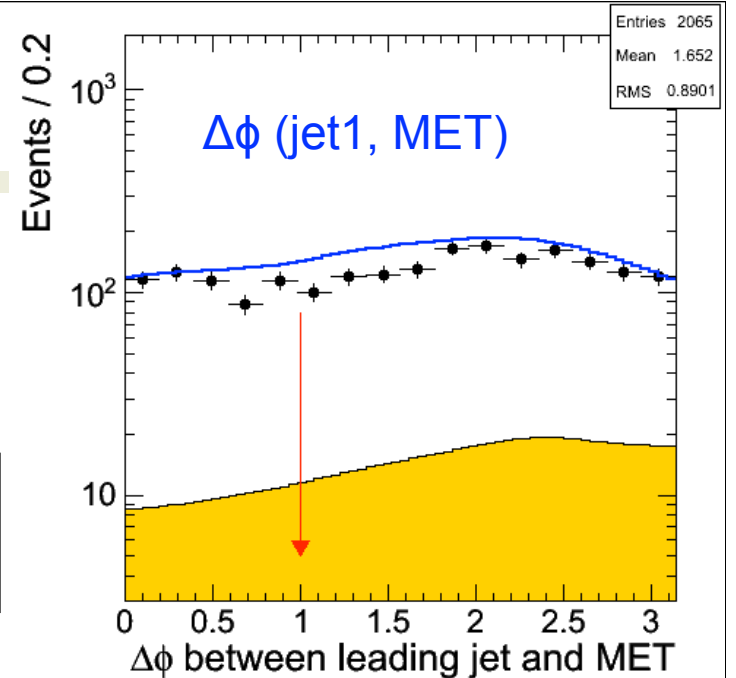
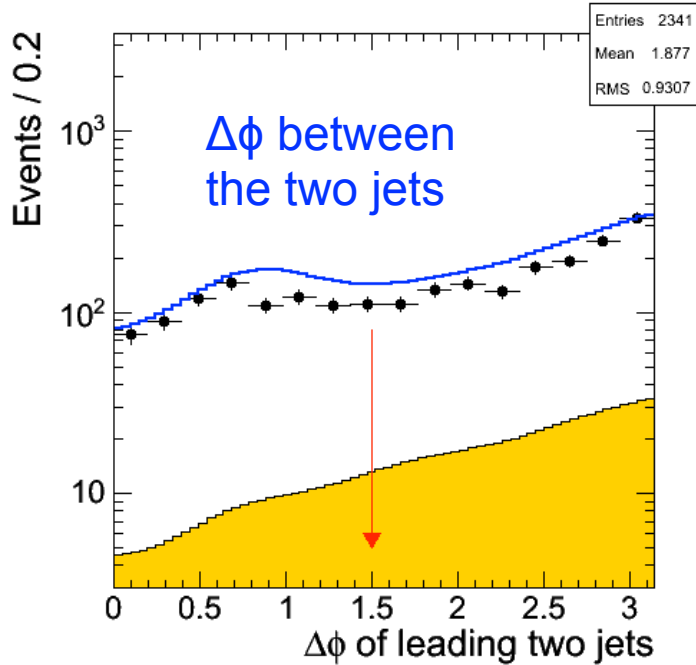
Cut flow: $\Delta\eta$ between the two jets



Cut on either $\cos\theta^*$ or $\Delta\eta$ has essentially the same background rejection power.

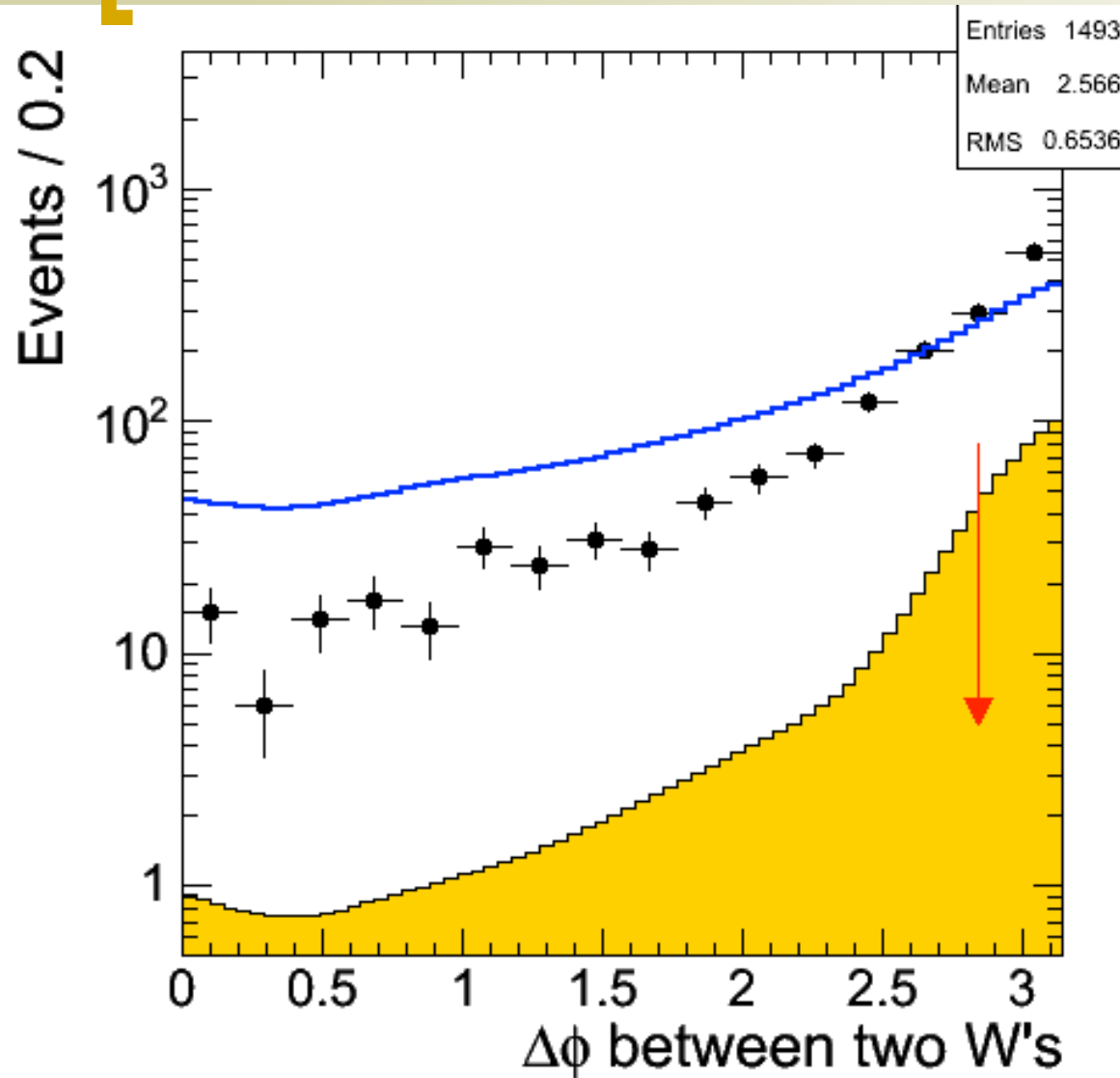


Cut flow: angular information



Angular distributions provide some discrimination between WW and QCD W+jj

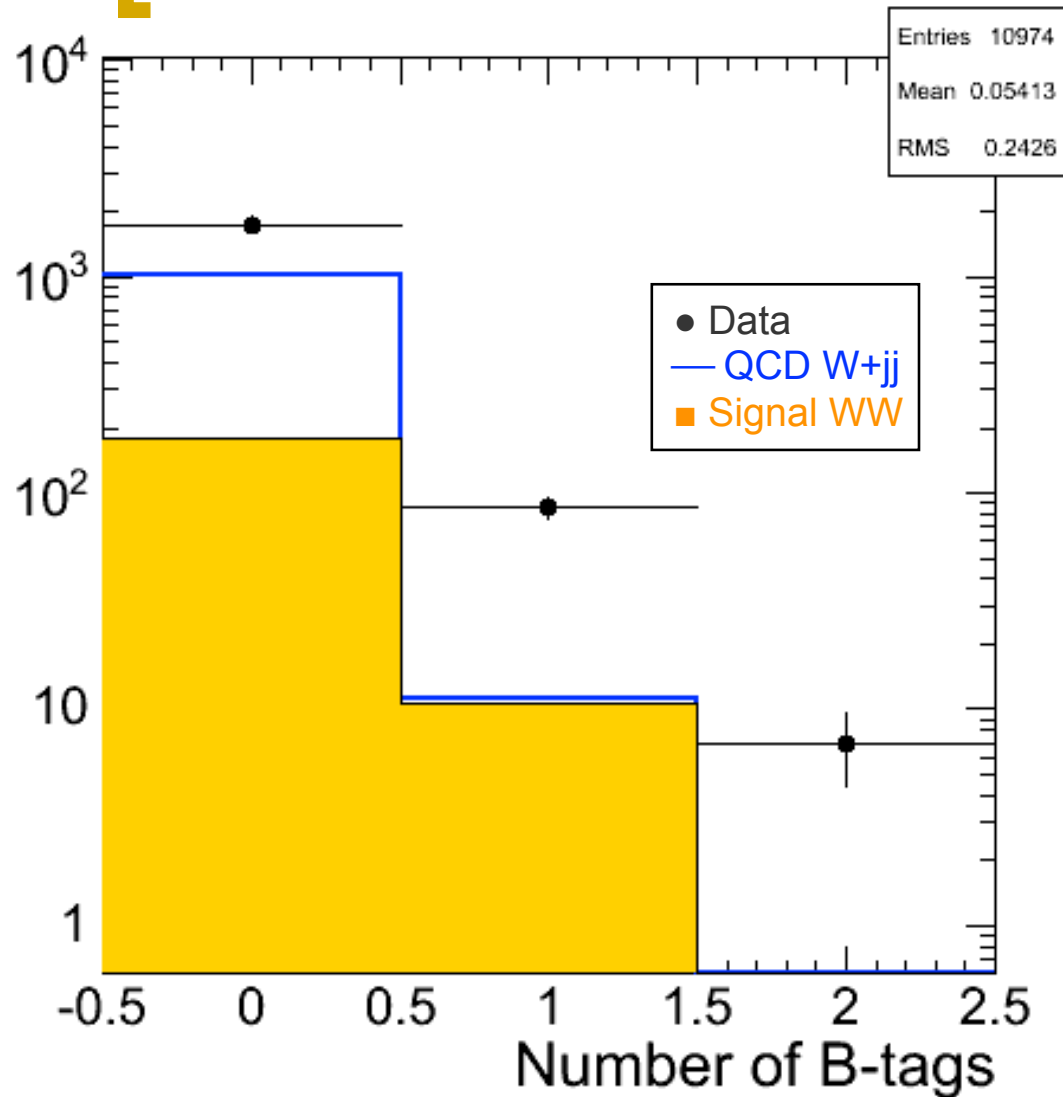
Cut flow: $\Delta\phi$ between leptonic and hadronic W



Signal is mostly back-to-back. Background has less steep fall.



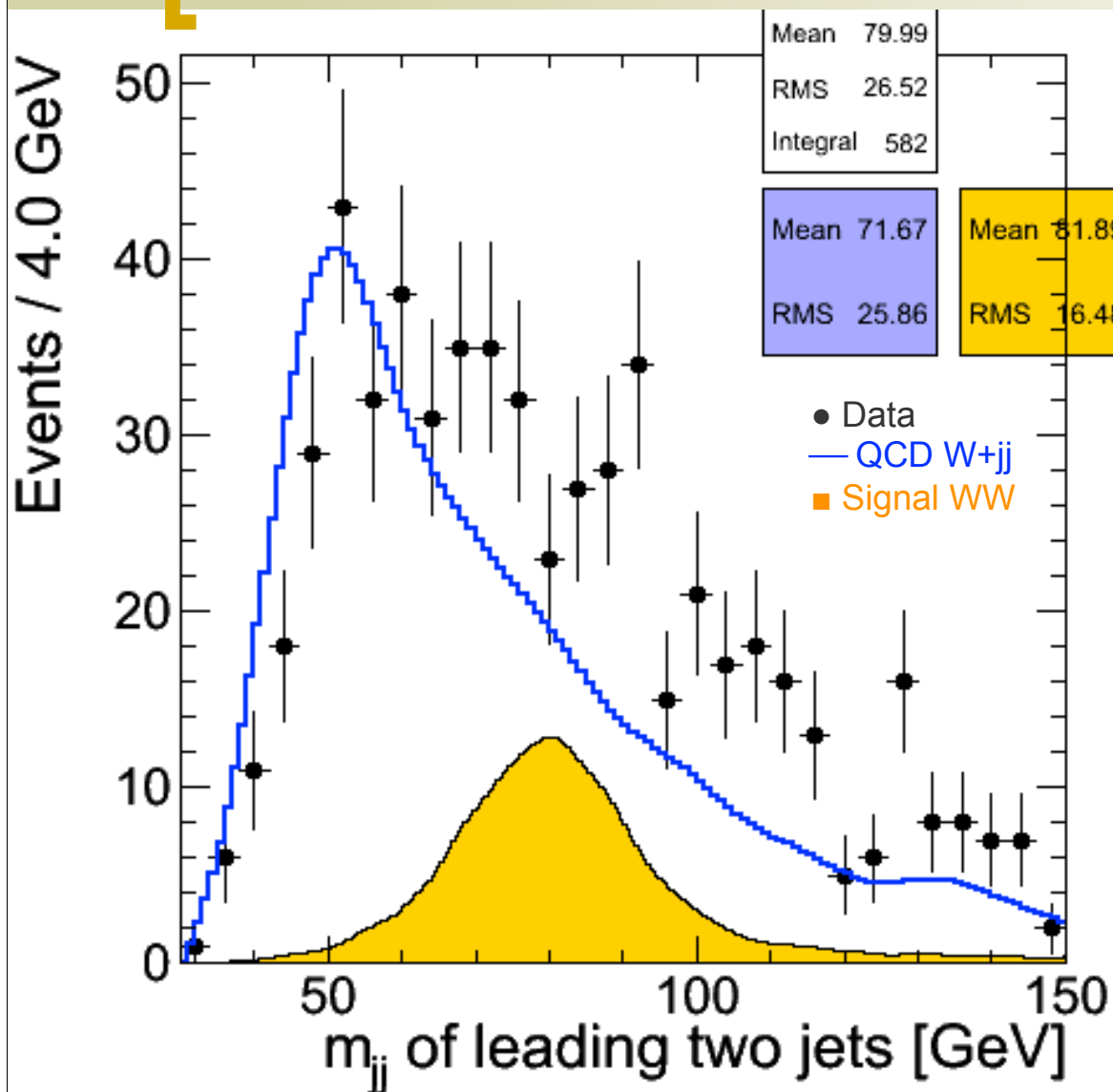
Cut flow: veto B-tagged jets



To remove top background
keep only those events
which have exactly 0 B-tags



m_{jj} distribution for W+jj events



observed events in data = 582

MC predicts:
QCD W+jj bkg = 451
WW/WZ signal = 99

Perhaps also need template from WZ Monte Carlo. For normalization I simply assumed $\sigma(WZ) = \sigma(WW)/3$

By now we have already exploited almost all the angular information. We haven't used the color-correlation between the two jets yet. I will try to explore what this can buy for us.