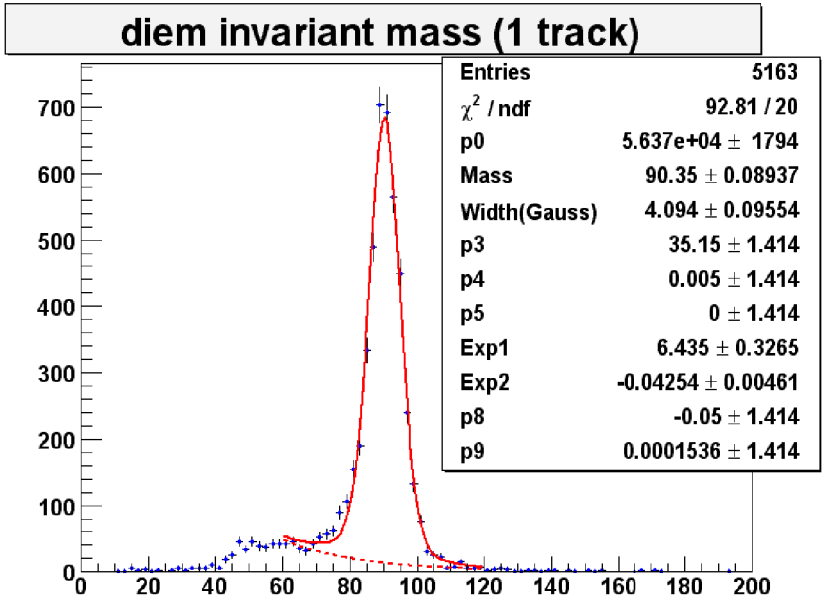
Status of my background studies

MC studies (PYTHIA): Taking background MC processes and running them through my analysis code using the standard cuts. Then using the cross sections for the normalisation.

Process	xsection in pb	#of Z(ee) events passing all cuts
W->enu	1899	5
Z->tautau	182	2
W->taunu	1903	<1
Z(ee)Z(bb)	.002	<1
WZ	.05	<1

QCD background based on fitting

- Full dataset
- CC-CC topology
- Standard cuts with at least 1trk match requirement
- Fitting exponential and convolution of Gaussian & BW to the diem invariant mass plot to separate pure Z->ee from DY+QCD
- Then using WZgroups result of (1.7+-.4)% for the percentage of events attributable to the photon propagator in Z/Gamma*->ee to get number of signal events (pure Z->ee plus DY) and number of events from QCD.



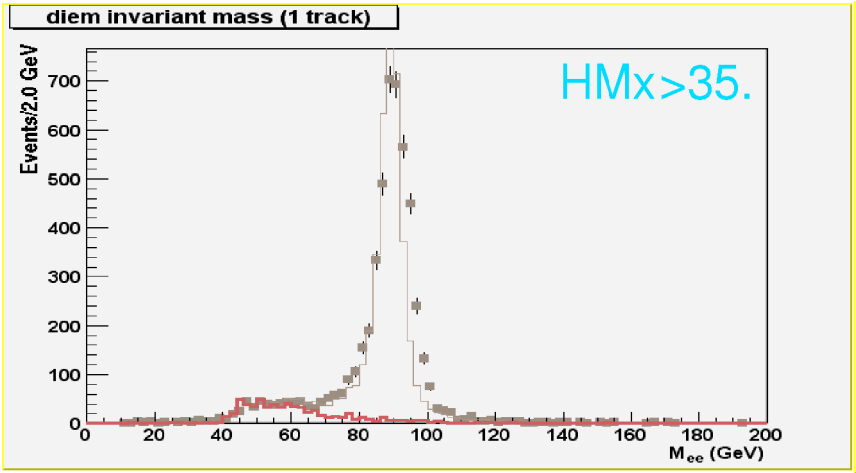
Total # of events (80-100GeV) = **3949**

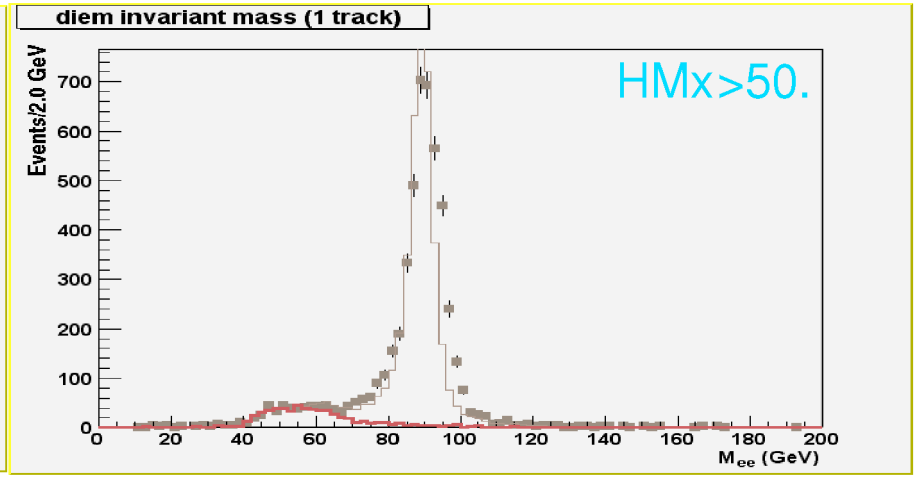
from QCD and DY (80-100GeV)= 140

=> Signal = Z + DY = 3875
Background = QCD = 74

QCD background a la WZgroup

- Fitting the diem invariant mass distribution to a linear combination of a signal shape, obtained from Z/Gamma* events (Pythia), and a background shape determined from data based on 'anti-electron' cut. In more detail: I calculate the chissquare between the diem invariant mass distribution and the lin.comb. of the signal and background shapes. Then I use ROOTs TMinuit class (Minimisation package) to minimize the chisquare based on the MIGRAD minimisation algorithm.
- **Note**: I also apply an additional 3% Gaussian smearing to the MC Z peak to match the width of the peak in data: **E(smeared) = E(un-smeared) * (1 + Gauss * .03)**
- The anti-electron cut is HMx>35.0 (good electrons are required to have HMx<20.). As a systematic check I also did the whole thing for HMx>50.





=> Signal = Z + DY = 3870
Background = QCD = 79

=> Signal = Z + DY = 3895
Background = QCD = 54