E214 The ATLAS Experiment

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1. W-mass

With the finished calibration, the mass of the W-boson can now be measured. In order to determine the W-mass, we use a data set of actual ATLAS data containing $W \to e\nu$ events, as well as several simulated data sets also containing $W \to e\nu$ events. There is also a $Z^0 \to e^+e^-$ data set to check the validity of the previous calibration. Finally there are data sets for QCD- and non-QCD background events.

1.1. Electron Calibration Verification

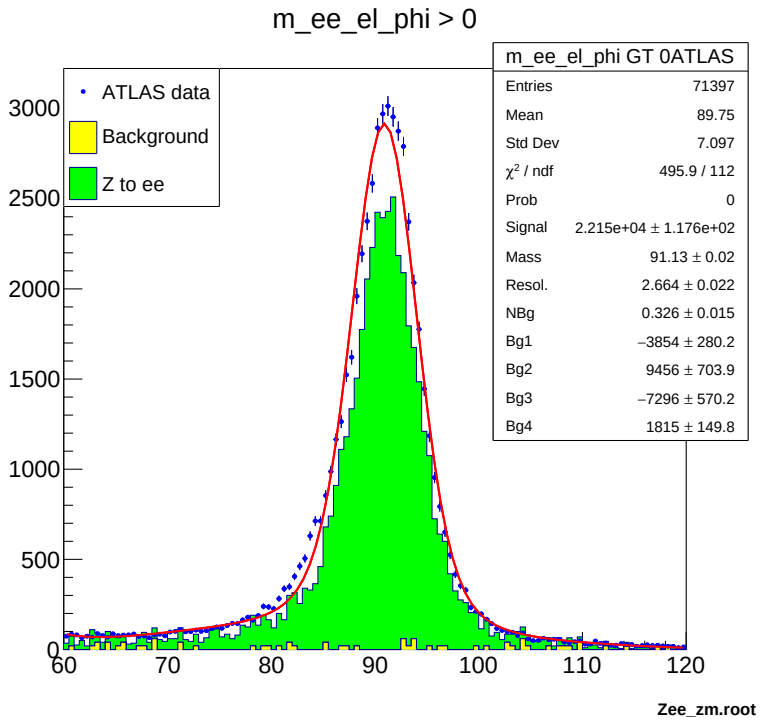

Figure 1: $Z_m ass_c heck_e l_p t - cut.pdf$

1.2. QCD scale factor

1.3. Cut selection

1.4. Gauge curves

1.5. W-mass

cut selection	$M_{Z^0,meas}$ / GeV	$\left\lvert\frac{M_{Z^0,meas}-M_{Z^0,lit}}{M_{Z^0,meas}}\right\rvert$
$p_{T,e^\pm} > 40$ GeV	91.71 ± 0.02	
$p_{T,e^\pm} < 40$ GeV	90.5 ± 0.0	
$35 < p_{T,e^\pm} < 55$ GeV	91.43 ± 0.02	
$\eta > 2$	89.89 ± 0.05	
$\eta < 0.5$ & $p_{T,e^\pm} > 40$	91.69 ± 0.02	
$\eta < 0.5$ & $p_{T,e^\pm} < 40$	90.56 ± 0.03	
$\phi < 0$	91.14 ± 0.02	
$\phi > 0$	91.13 ± 0.02	

Table 1: Measured Z^0 mass for different cut selections

A. Appendix