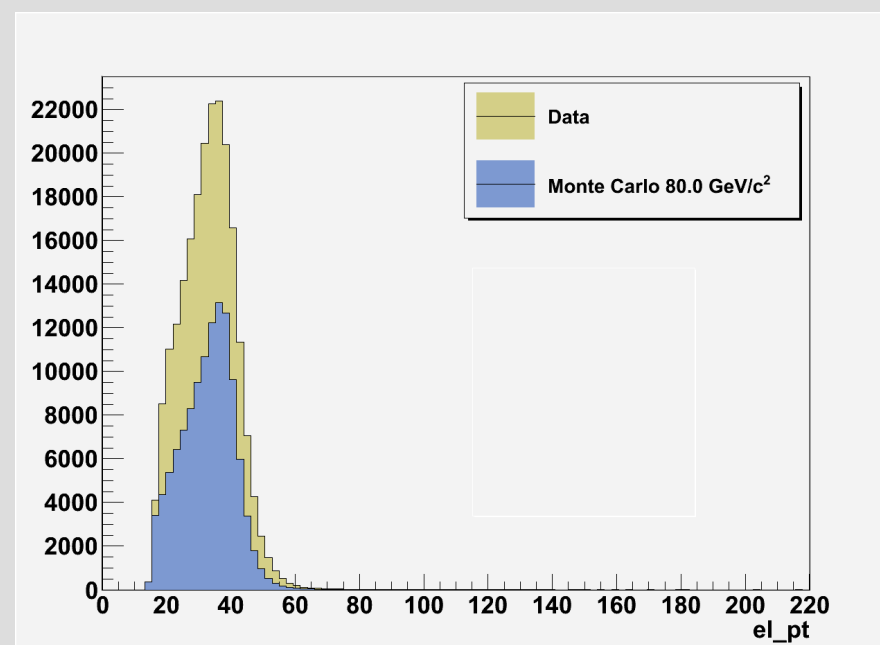
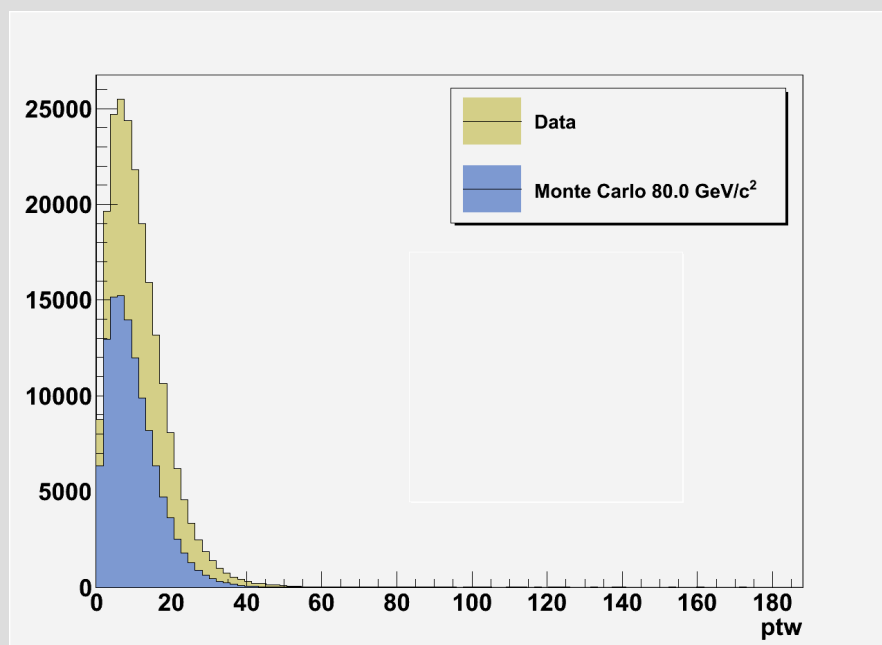


Tutorial in W-Physics

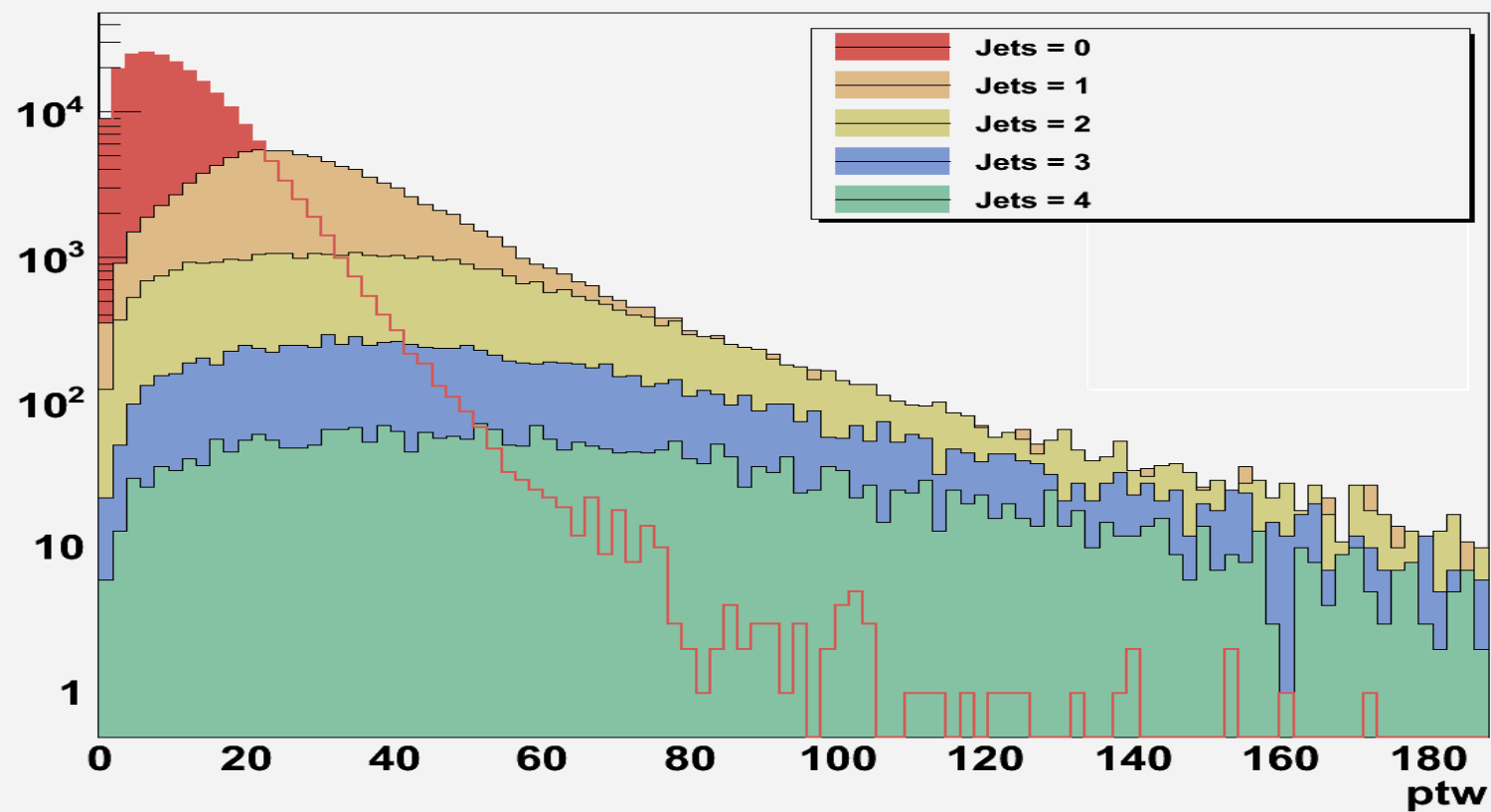
A review by
Sven Pirner,
Mathias Wegner,
Daniel Glodeck

Task 1

Comparison between Monte-Carlo and used data

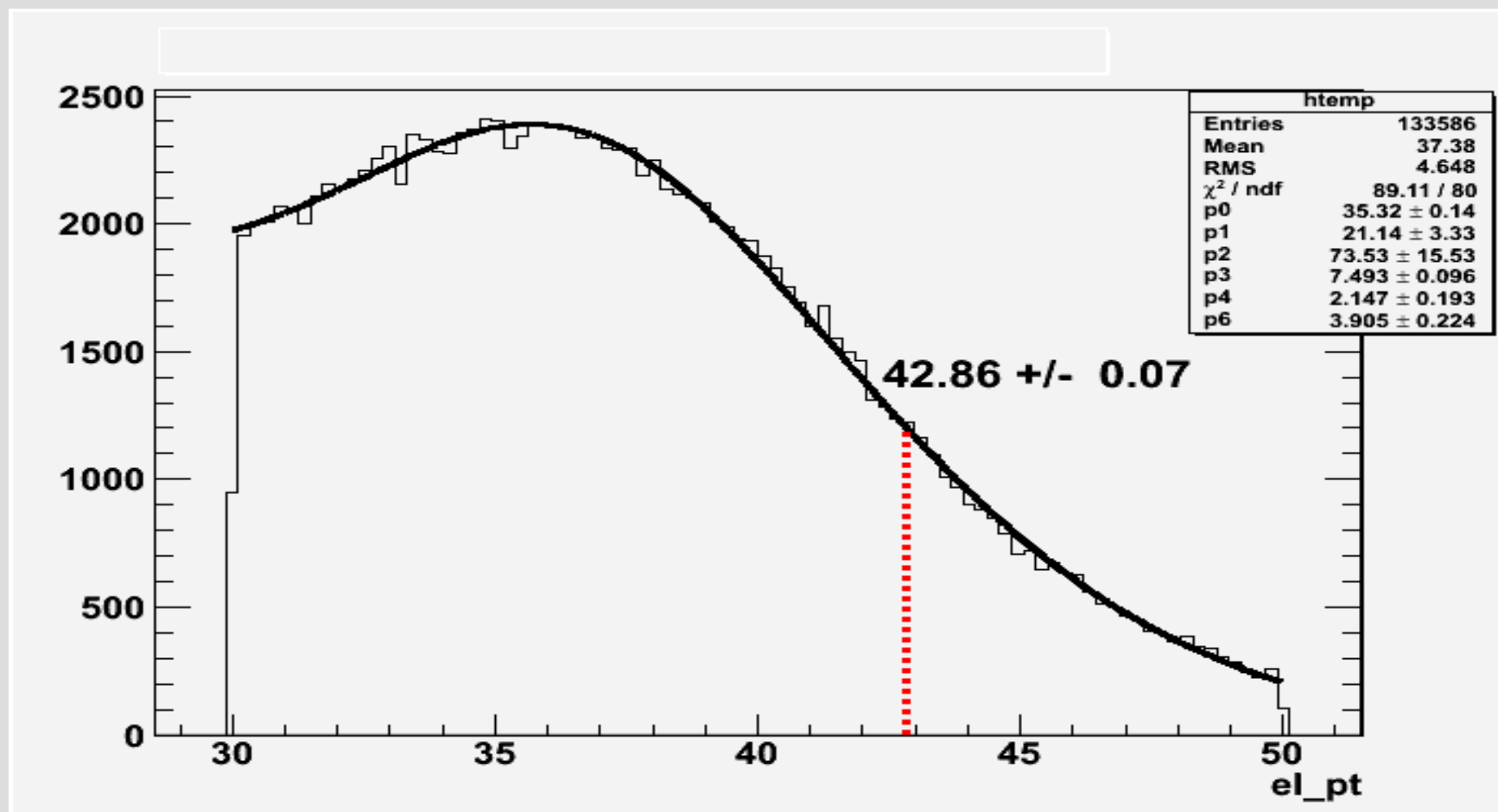


Plot of W transverse momentum (njets)



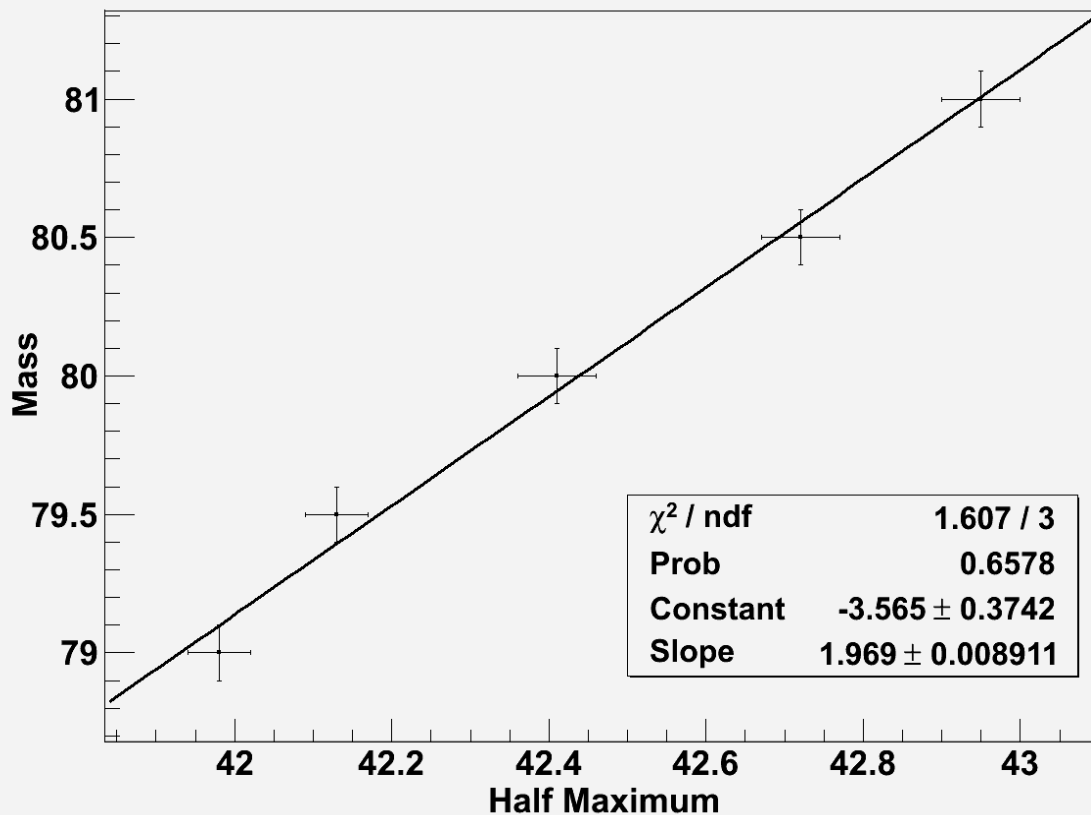
➡ Use Cut "0 Jets" to use the full transverse Momentum

Determination of the half maximum el_pt



Calibration with Monte-Carlo data and Determination of $M(W)$

Linear fit



Mass (MC) [GeV]	half Maximum pt [GeV]	error [GeV]
79.0	41.98	0.04
79.5	42.13	0.04
80.0	42.41	0.05
80.5	42.72	0.05
81.0	42.95	0.05

➡ $M(W) = 80.83 \text{ GeV}$

Error-Calculation of Wmass

Determination of the Mass :

$$M(W) = m \cdot x$$

Determination of the Error : $dM = \sqrt{(m \cdot dx)^2 + (x \cdot dm)^2 + (dn)^2}$

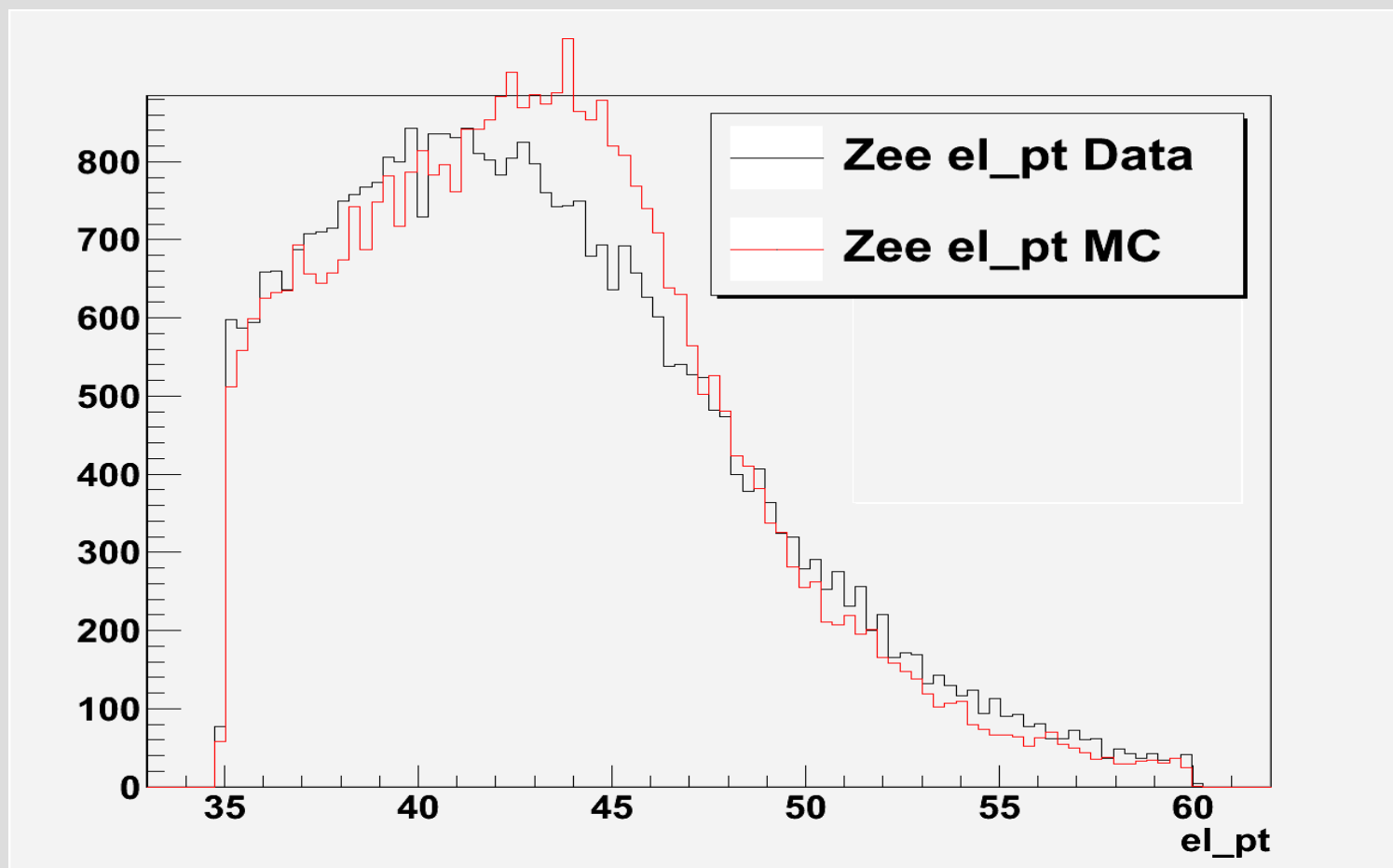
Errorsources	Value	Error
half maximum value x	42.86	0.070
slope m	1.969	0.009
offset n	-3.565	0.374

➡ $Mass(W)_{\text{exp}} = (80.83 \pm 0.55) \text{ GeV}$

$Mass(W)_{\text{Lit}} = (80.42 \pm 0.04) \text{ GeV}$

Task 8

Test of MC with Z $\rightarrow$ ee data



Conclusion

Advantage of the Tutorial:

- ✓ It was possible to make the tutorial in the given time!
- ✓ It was easy to play with cuts and have a look on the different results and its errors
- ✓ We had a good result at the end

Disadvantage of the Tutorial:

no disadvantage

Result: It was maybe the best tutorial of the week