

$W_L W_L$ scattering :

- (i) The effect of the Underlying Event (UE)-new.
- (ii) Update on Full Simulation/ATLFAST comparison.

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Efficiencies with ... 3 decimal points

600k events of Signal and 3M events of Background...

Cross-section σ (fb)	Signal	$t\bar{t}$	W+jets	Significance for $L = 30 \text{ fb}^{-1}$
Generated	44	15640	62600	0.88
<i>Cuts</i>				
P_T Leptonic W	3.310 ± 0.015	422.812 ± 1.464	2889.370 ± 7.583	0.33
P_T Hadronic W	2.587 ± 0.013	191.955 ± 0.994	1816.920 ± 6.067	0.33
η Hadronic W	2.587 ± 0.013	191.955 ± 0.994	1816.920 ± 6.067	0.33
Mass Hadronic W	2.037 ± 0.012	88.799 ± 0.678	209.293 ± 2.086	0.66
Y Scale	1.735 ± 0.011	72.293 ± 0.612	113.953 ± 1.541	0.71
Top Veto	1.573 ± 0.011	4.103 ± 0.146	53.127 ± 1.0524	1.15
P_T, E, η Tag Jets	0.447 ± 0.006	0.052 ± 0.016	0.376 ± 0.089	3.73
P_T hard scatter	0.438 ± 0.006	0.026 ± 0.012	0.209 ± 0.066	4.93
Number of Mini-jets	0.438 ± 0.006	0.026 ± 0.012	0.209 ± 0.066	4.93

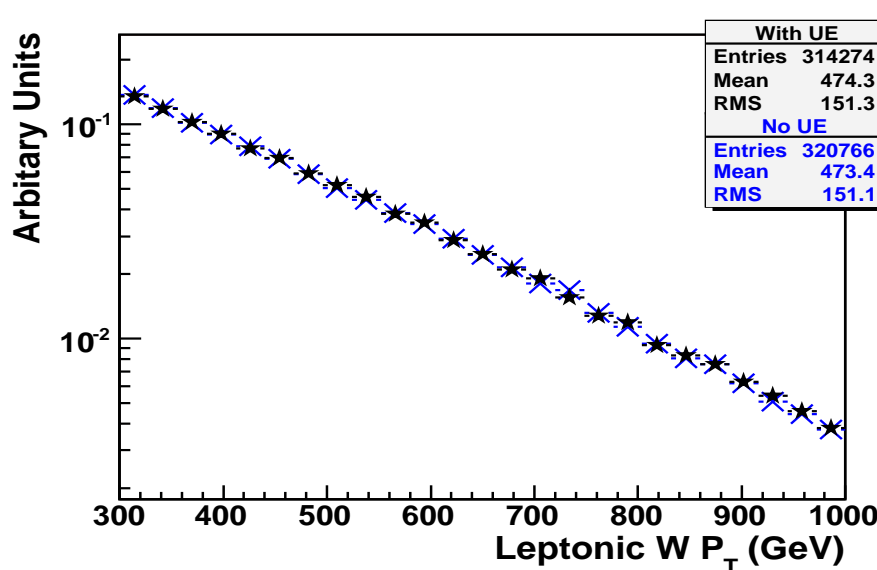
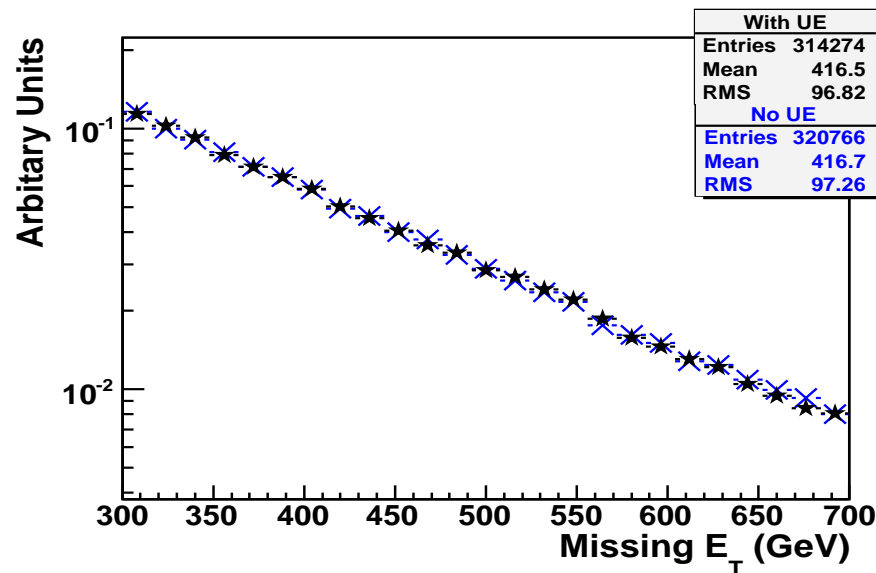
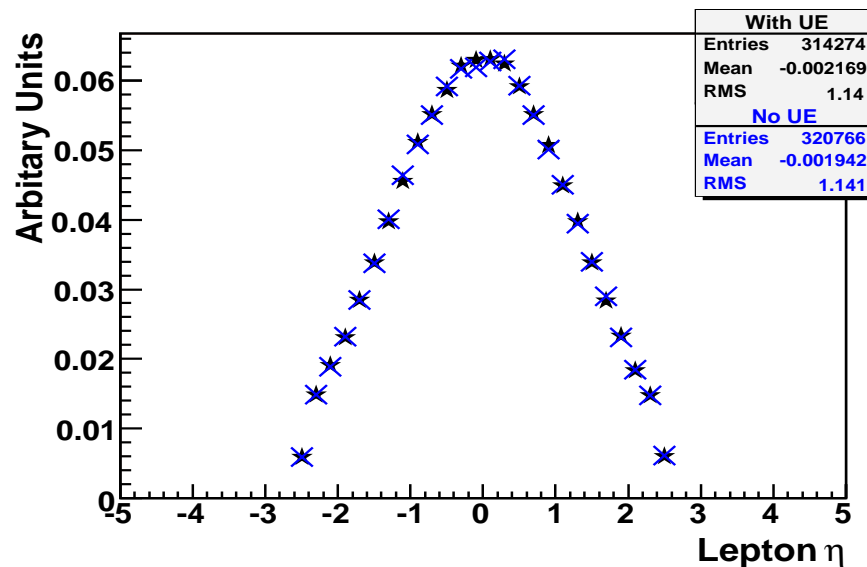
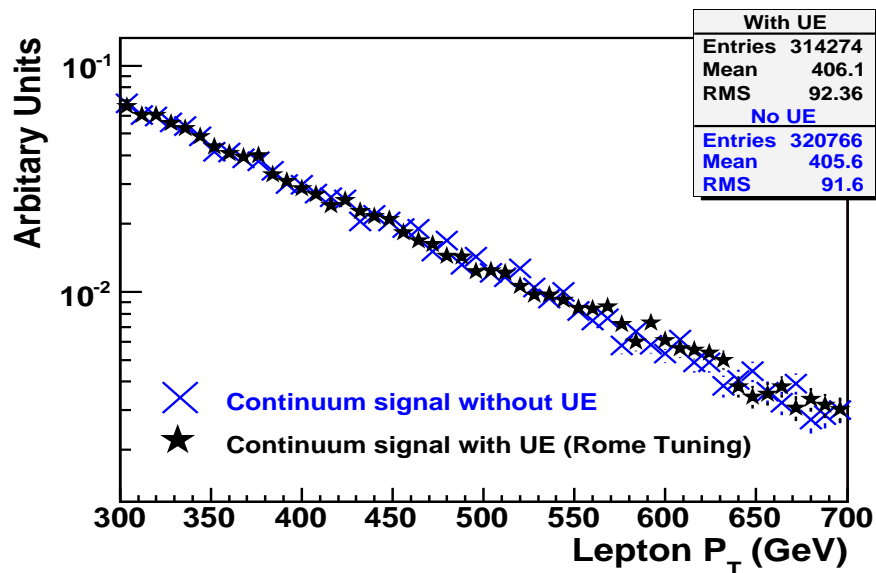
1.2M events of Signal...

Cross-section σ (fb)	Signal with UE	Signal without UE
Generated	44	44
<i>Cuts</i>		
P_T Leptonic W	3.301 ± 0.011	3.338 ± 0.011
P_T Hadronic W	2.579 ± 0.009	2.607 ± 0.009
η Hadronic W	2.579 ± 0.009	2.607 ± 0.009
Mass Hadronic W	2.038 ± 0.008	2.082 ± 0.009
Y Scale	1.735 ± 0.008	1.763 ± 0.008
Top Veto	1.573 ± 0.007	1.642 ± 0.008
P_T, E, η Tag Jets	0.444 ± 0.004	0.450 ± 0.004
P_T hard scatter	0.434 ± 0.004	0.444 ± 0.004
Number of Mini-jets	0.434 ± 0.004	0.444 ± 0.004

- The η cut hasn't been applied at John's paper and it has been applied together with the mass cut at Sarah's note. Since there has not effect, it is better to remove it or to include it to the Pt or mass cut
- The Mini-jets cut is expected to have negligible effect on Signal but significant on the Backgrounds. It is not the case here..Needs further look.

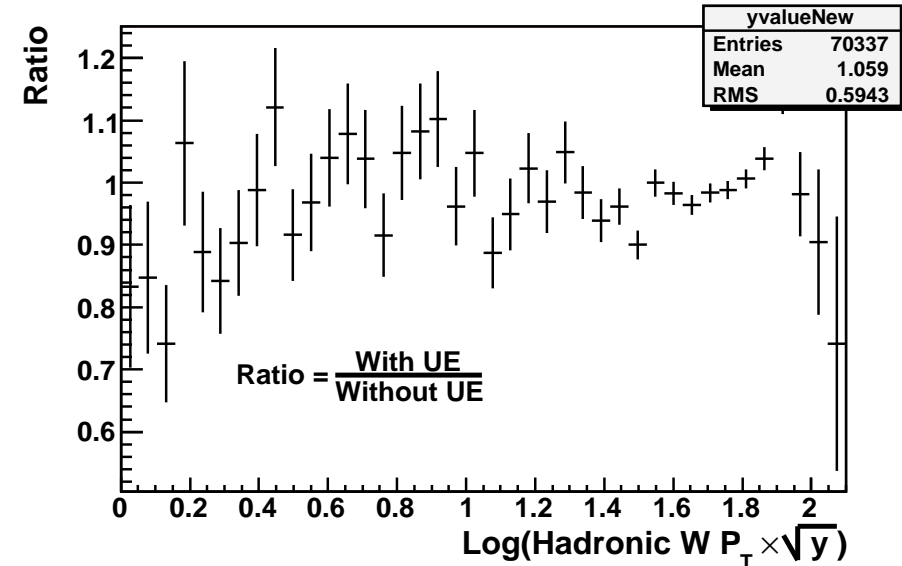
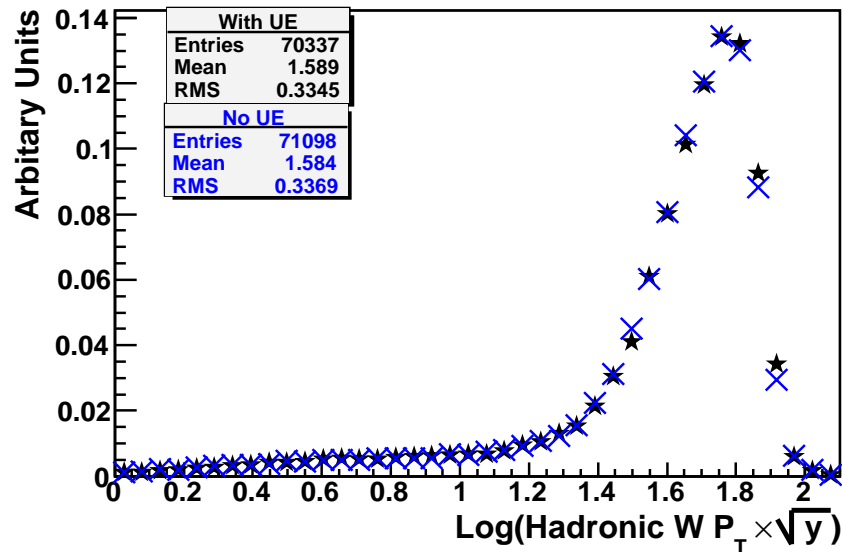
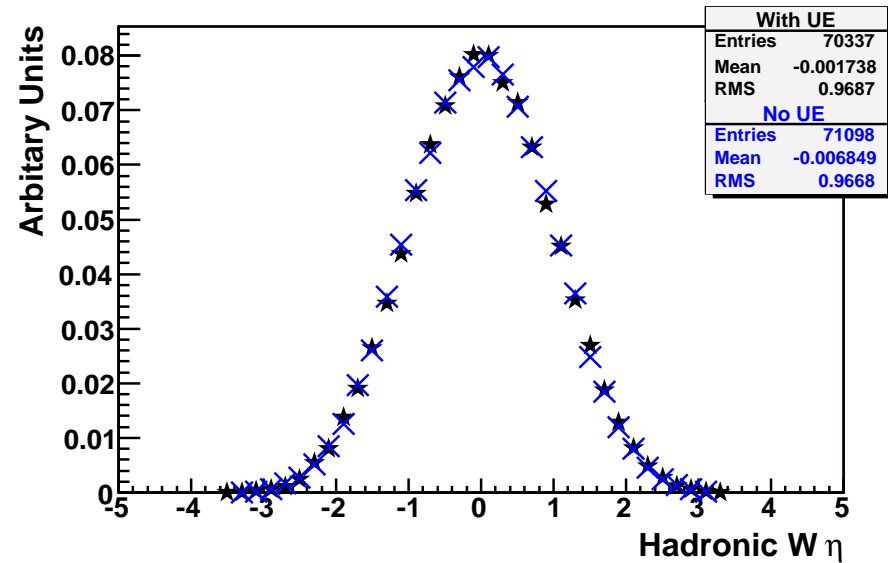
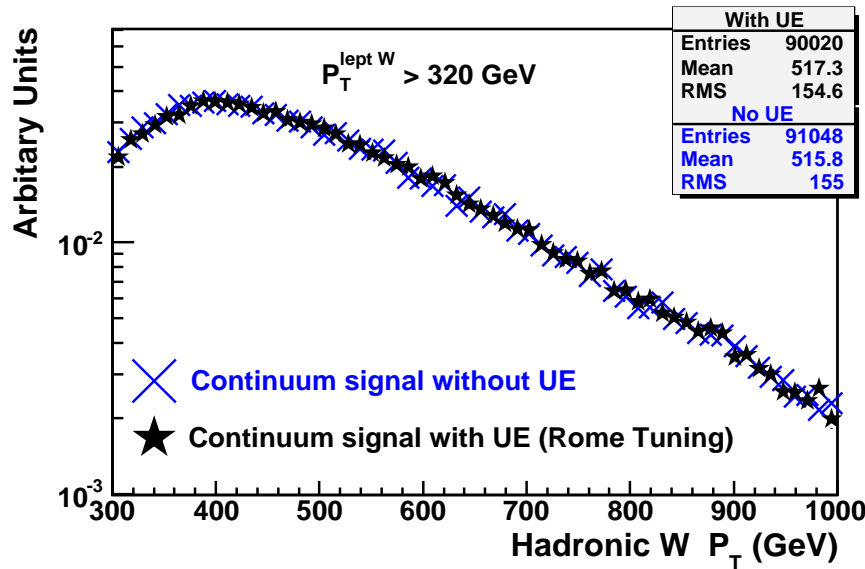


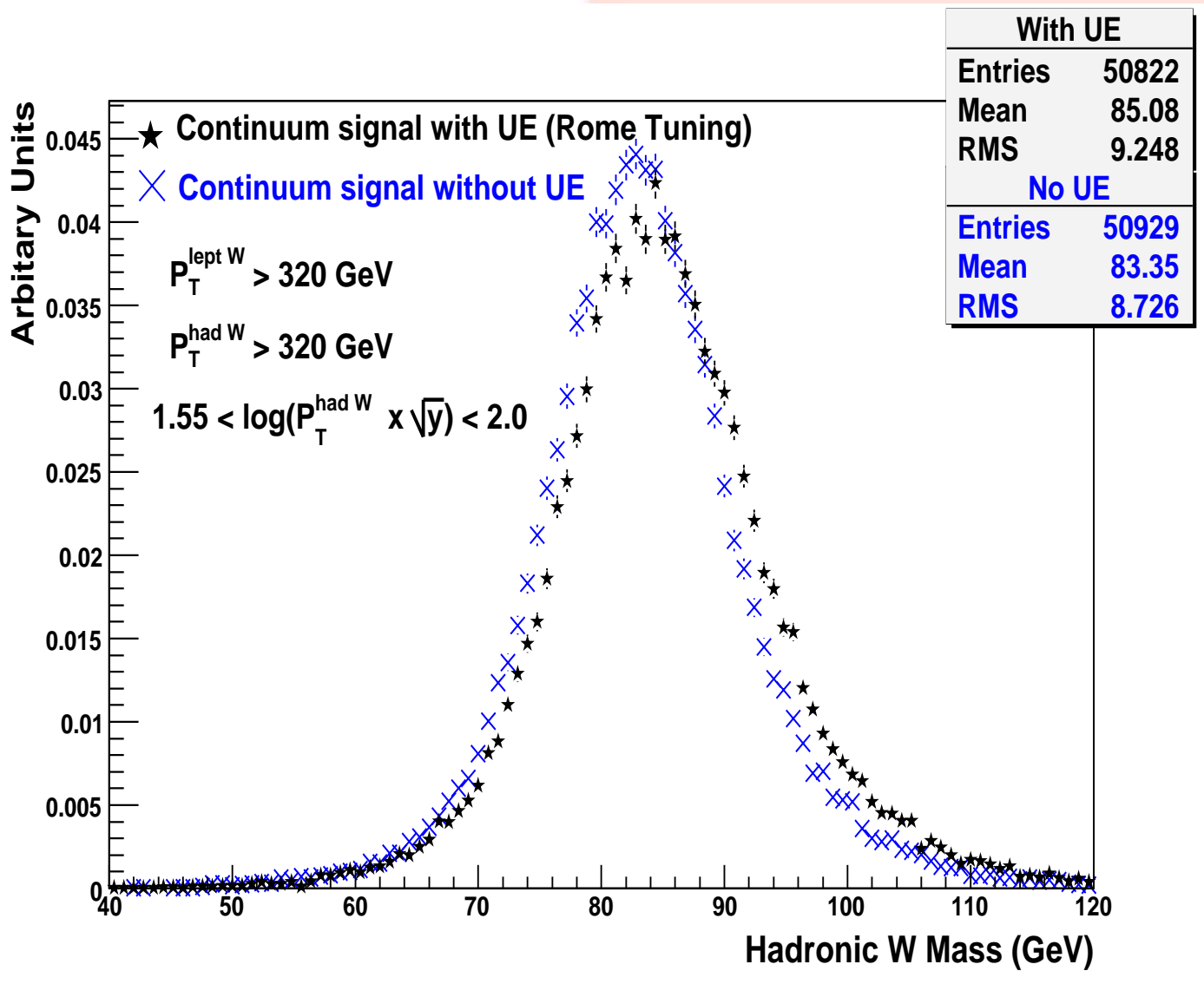
Effect of the UE on the Leptonic sector





Effect of the UE on the Hadronic sector

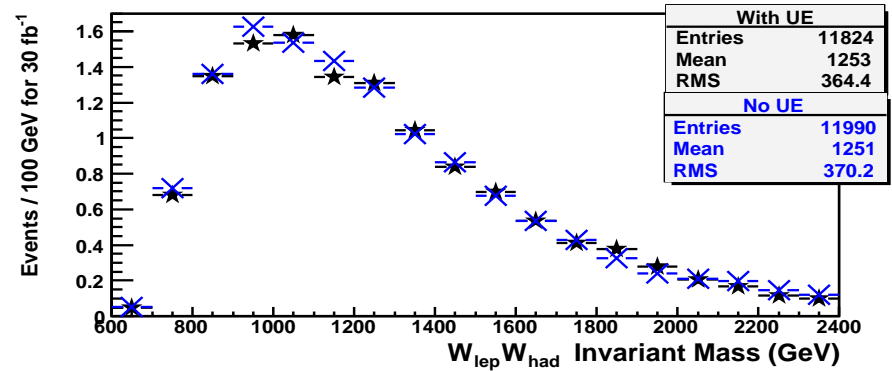
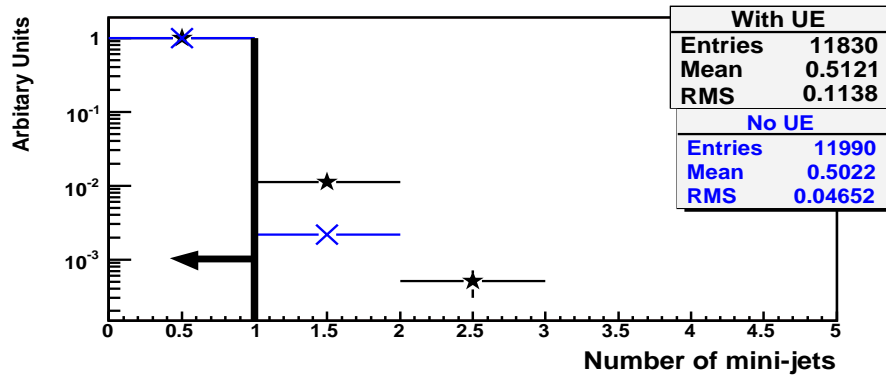
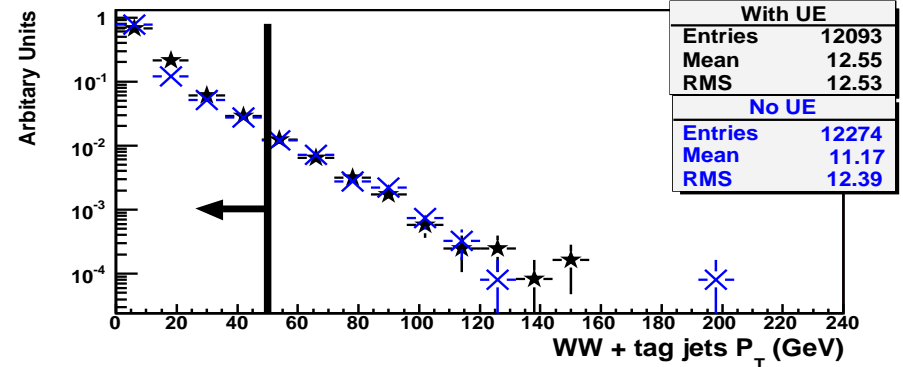
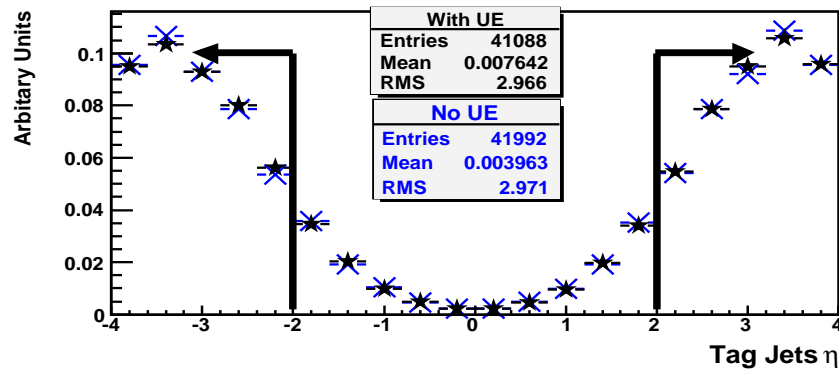
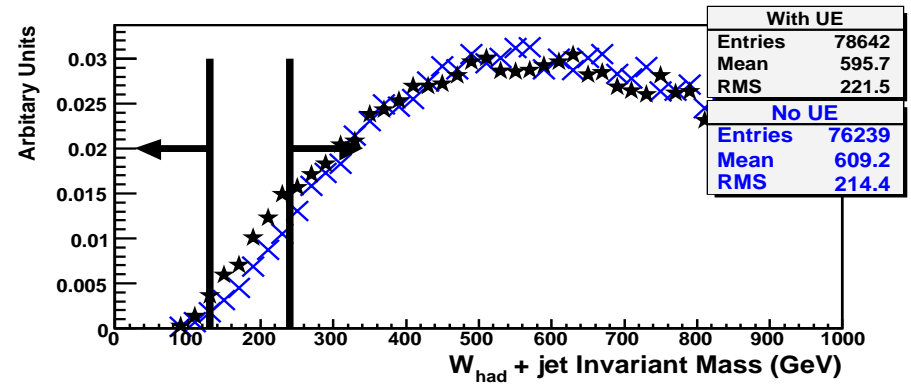
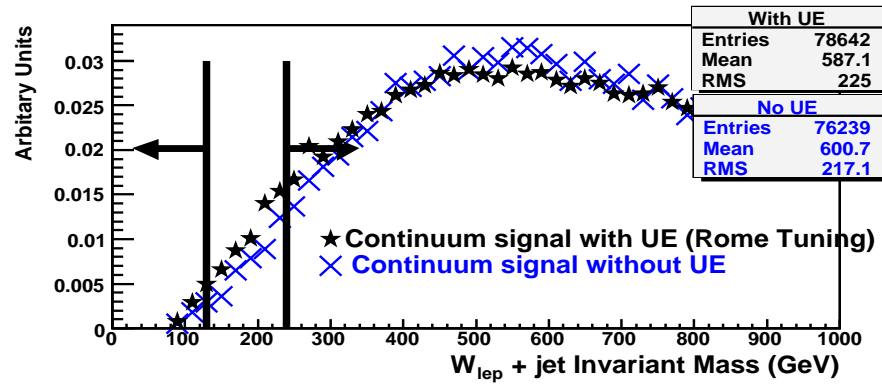




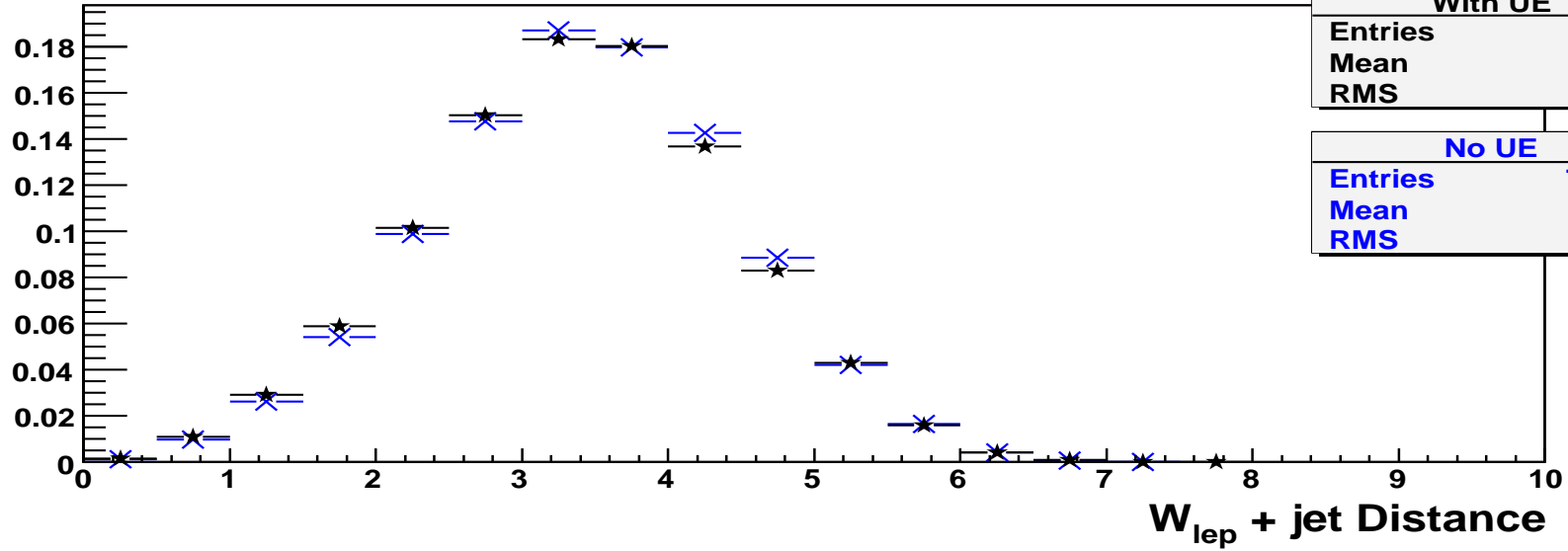
Gaussian fit in the range 70-95 GeV gives a rise of **1.7% on the mean value** (82.91 GeV → 84.35 GeV) and **5.9% on the sigma** (6.99 GeV → 7.40 GeV) of the distribution.



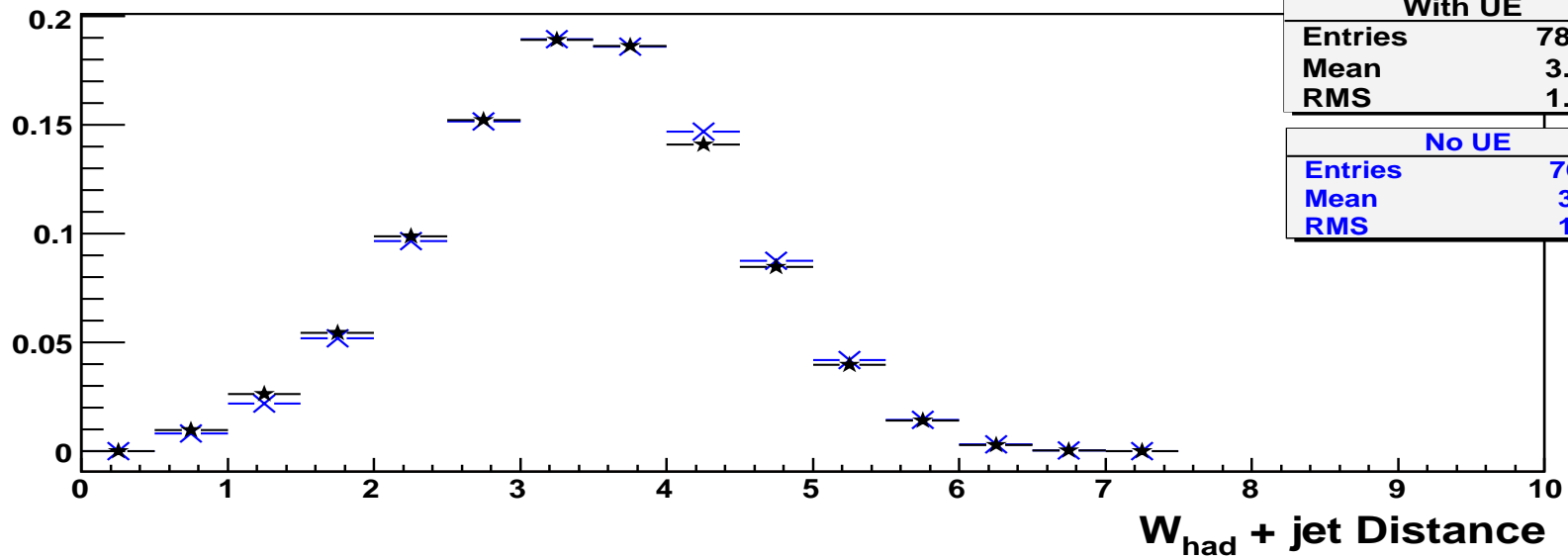
Effect of the UE on the Hadronic Features



Arbitrary Units

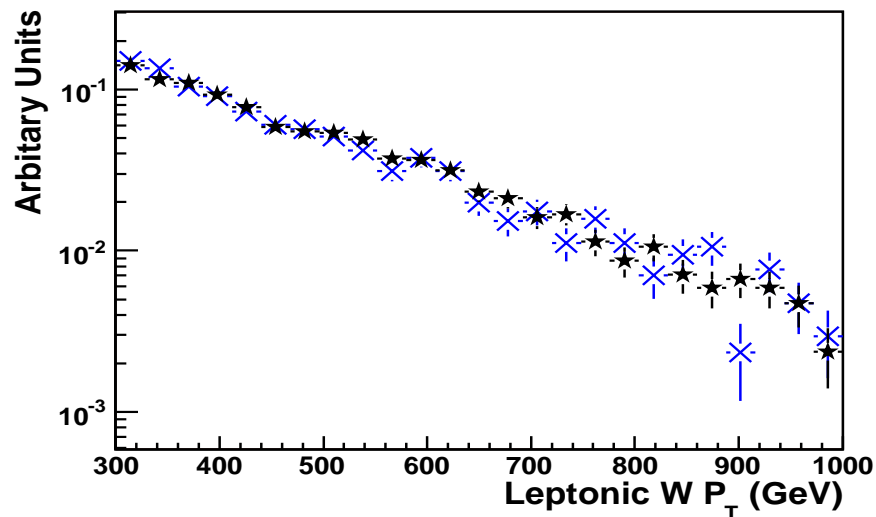
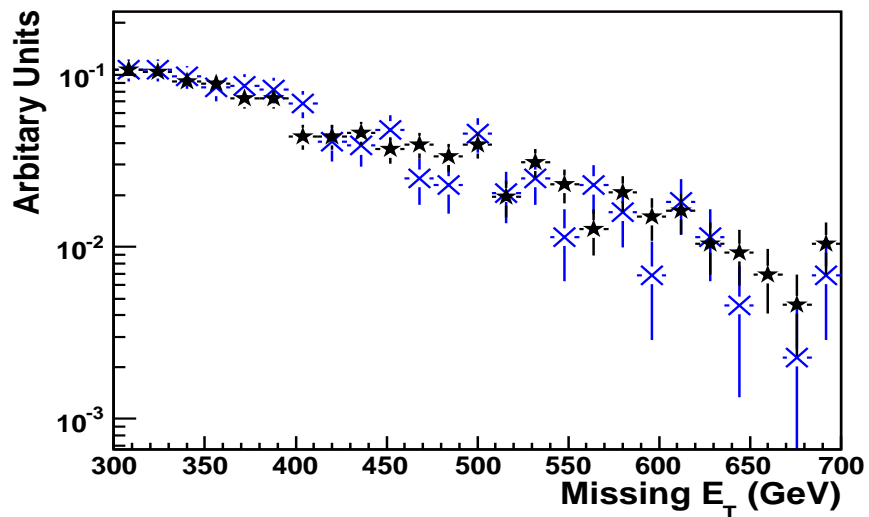
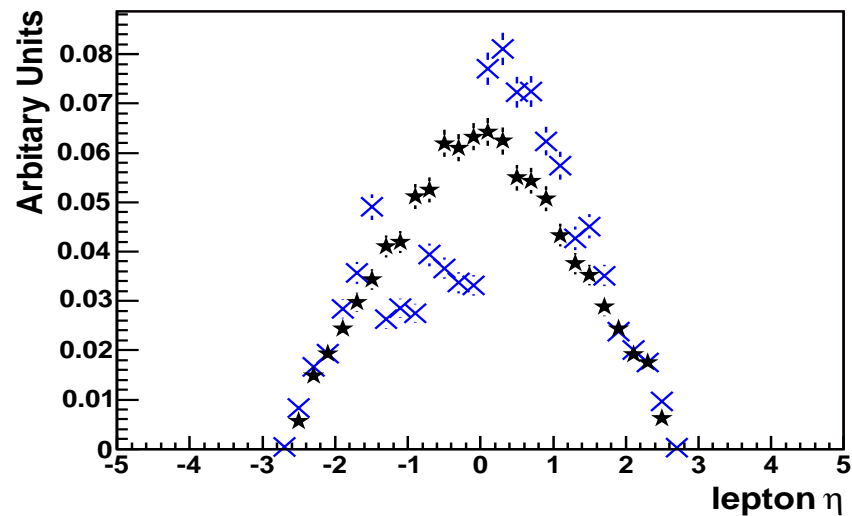
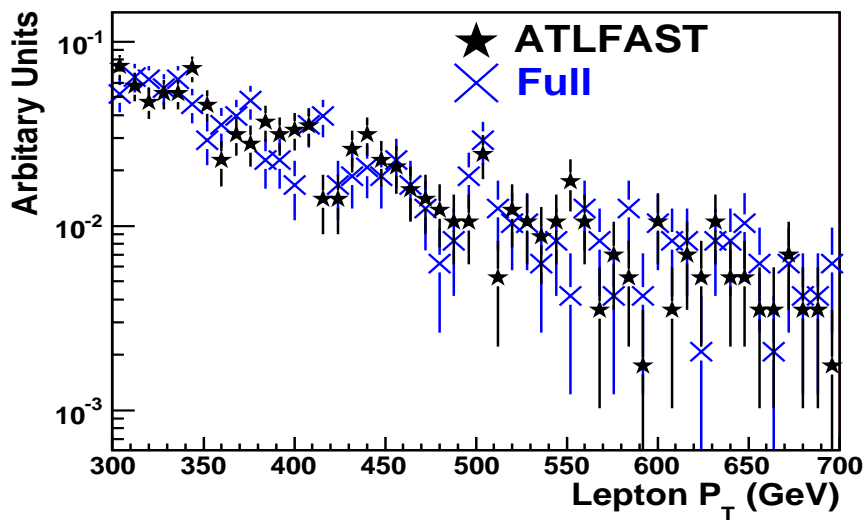


Arbitrary Units





Comparison between Full & Fast Simulation: The Leptonic Sector



Comparison between Full & Fast Simulation: The Lepton Problem

