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# $W_L W_L$ scattering : Efficiencies Results with new production.

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Features of this production:

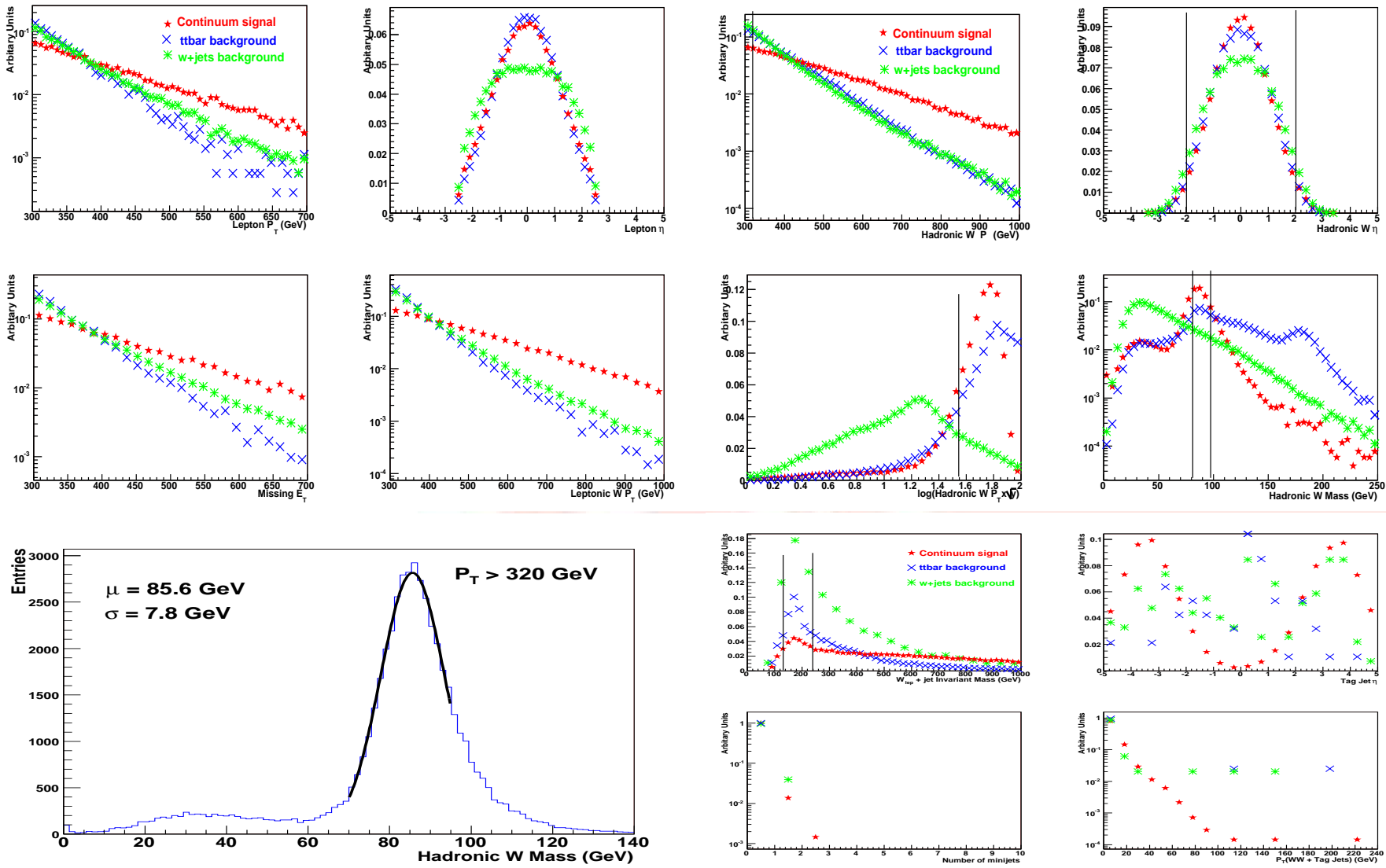
- PYTHIA 6.226 (release 10.0.1).
- Rome underlying events tuning.
- 600k events for signal (Continuum), 1.2M events for  $t\bar{t}$  and 1.5M for w+jets.
- **Parton Density Fuction used: MRST2001E.**
- **Allow all decays of the Ws, i.e final state can have:  $l\nu jj, l\nu l\nu, jjjj$ .**
- **Minimum Pt of the Hard Scatter: 3 GeV(signal), 300 GeV (ttbar) and 250 GeV (wjets).**

New cross sections:

- Continuum Signal: 44 fb
- $t\bar{t}$ : 15640 fb
- w+jets: 62600 fb

...in full agreement with Sarah's note and partial agreement with John's paper (see next).

# Cross Sections and Efficiencies at each step.





## Cross Sections and Efficiencies at each step.

\*In John's paper, they first applied the cut on the hadronic W Mass and Eta and **then** the Y-cut

$\sigma$ in fb (% efficiency)	signal			t $\bar{t}$			wjets		
	Stathis	Sarah	John*	Stathis	Sarah	John*	Stathis	Sarah	John*
<b>Generated</b>	44.00 (100%)	43.90 (100%)	47.00 (100%)	15640.00	15570.00	18000.00	62600.00	62430.00	65000.00
<b>W Pt</b>	2.99 (6.79%)	2.44 (5.55%)	4.70 (10%)	337.43	271.00	910.00	2784.74	2398	4400.00
<b>Y-param</b>	2.20 (5.01%)	1.74 (3.96%)	<b>2.70 (5.8%)</b>	199.45	155.52	<b>56.00</b>	448.17	235.26	<b>700.00</b>
<b>W Mass-Eta</b>	1.74 (3.96%)	1.52 (3.46%)	<b>1.90 (4.1%)</b>	59.2	95.94	<b>28.00</b>	156.42	126.19	<b>78.00</b>
<b>Top Veto</b>	1.07 (2.42%)	1.36 (3.09%)	1.80 (3.8%)	0.87	8.92	3.20	30.30	84.29	52.00
<b>Tag Jets</b>	0.51 (1.15%)	0.48 (1.10%)	0.67 (1.4%)	0.03	0.08	0.03	0.42	0.38	0.38
<b>Hard Pt</b>	0.50 (1.14%)	0.48 (1.08%)	0.65 (1.4%)	0.00	0.05	0.02	0.21	0.32	0.32
<b>MiniJets</b>	0.50 (1.14%)	0.47 (1.06%)	0.65 (1.4%)	0.00	0.04	0.01	0.21	0.28	0.24

Signal-to-Background Ratio:

	S/B		
	Stathis	Sarah	John*
<b>Generated</b>	$5.6 \times 10^{-4}$	$5.6 \times 10^{-4}$	$5.0 \times 10^{-4}$
<b>W Pt</b>	$9.6 \times 10^{-4}$	$9.1 \times 10^{-4}$	$8.8 \times 10^{-4}$
<b>Y-param</b>	$3.4 \times 10^{-3}$	$4.5 \times 10^{-3}$	$3.6 \times 10^{-3}$
<b>W Mass-Eta</b>	$8.1 \times 10^{-2}$	$6.9 \times 10^{-3}$	$1.8 \times 10^{-2}$
<b>Top Veto</b>	$3.4 \times 10^{-2}$	$1.5 \times 10^{-2}$	$3.2 \times 10^{-2}$
<b>Tag Jets</b>	1.13	1.04	1.6
<b>Hard Pt</b>	2.4	1.31	1.9
<b>MiniJets</b>	2.4	1.45	2.6

- Aim: Full simulation and reconstruction of the signal sample **only**.
- Machinery for the full simulation is ready.
- Timing for 20 events: av. time/event:  $20 \pm 2$  min. Total time of the run: 7.4 h
- Try to **filter** the sample at generation level: Request events with more than 1 lepton at  $|\eta| < 2.5$  and  $P_T > 10 \text{ GeV}$
- From ATLFAST: 223197 (37%) with at least one reconstructed lepton.
- Filtering gives: 290149 (48%) events to be simulated.