More Operators for Tribosons: More Backgrounds

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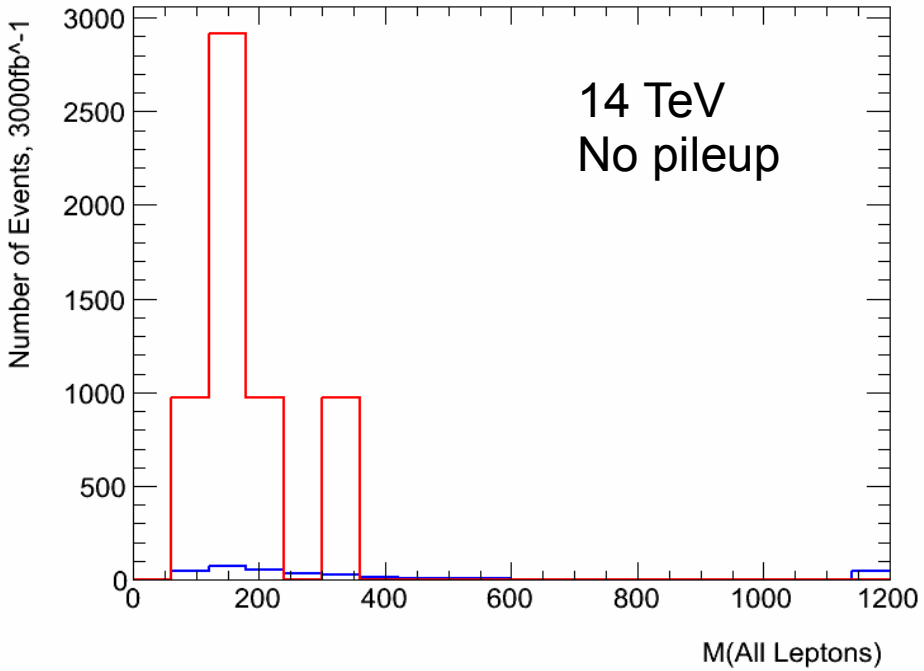
Backgrounds

- The Delphes code does contain jet-> electron efficiency, about 1/50,000 jets is mis-ID'd as an electron for no pileup, similar value for photons (from Z+jet, Z+gamma sample runs)
  - Z based events are well rejected by the flavor/charge selection
  - W+2 jets is rejected by the ID efficiency
  - ttbar-> dileptons is more problematic, having no Z's and having a slightly higher rate of jets -> leptons
    - Can reject events with cuts on N b jets, invariant mass, etc
    - However, with low MC statistics, it is hard to really evaluate this
    - For now, I state that the >= 1 TeV invariant mass bin, where most significance is from, shouldn't be impacted by this (isn't from my low mc stats sample). But plan investigation with more events from official samples post-Seattle for firm values

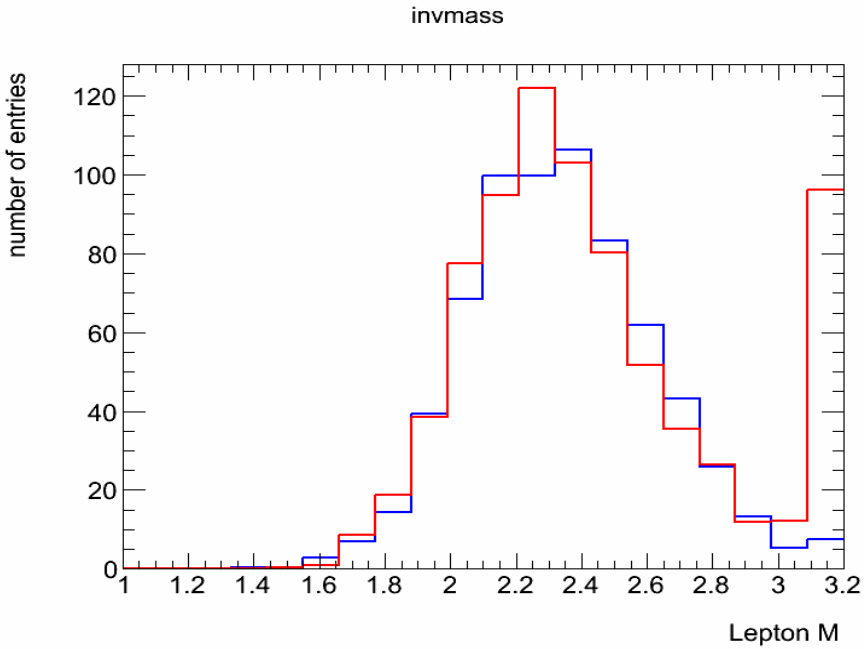
ttbar dilepton

- Red is ttbar dilepton, blue is the T0 signature
- Obviously MC stats are really bad. But fairly well away from > 1 TeV interesting region (>=3 leptons, flavor charge cut, 50k ttbar generated events)

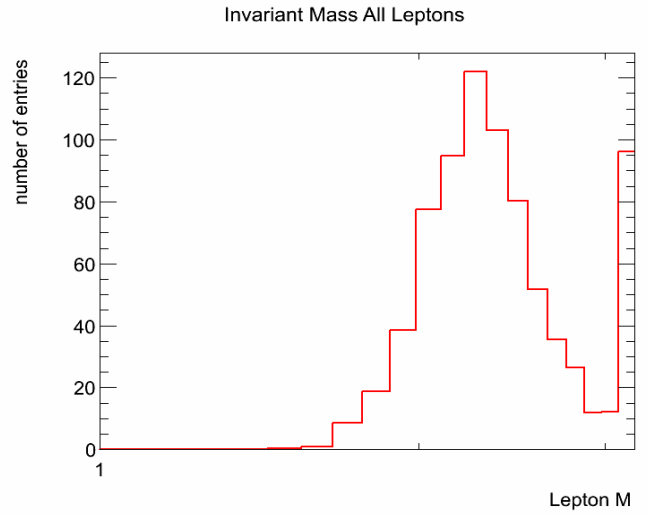


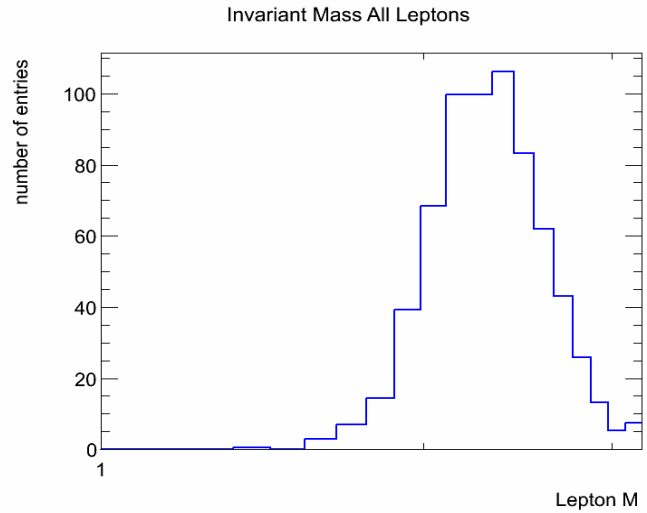
Log plots

- Tried plotting the Log10(inv mass)
- Don't think this is what people wanted...?
- 14.1 sig for regular, 14.9 for log(M)



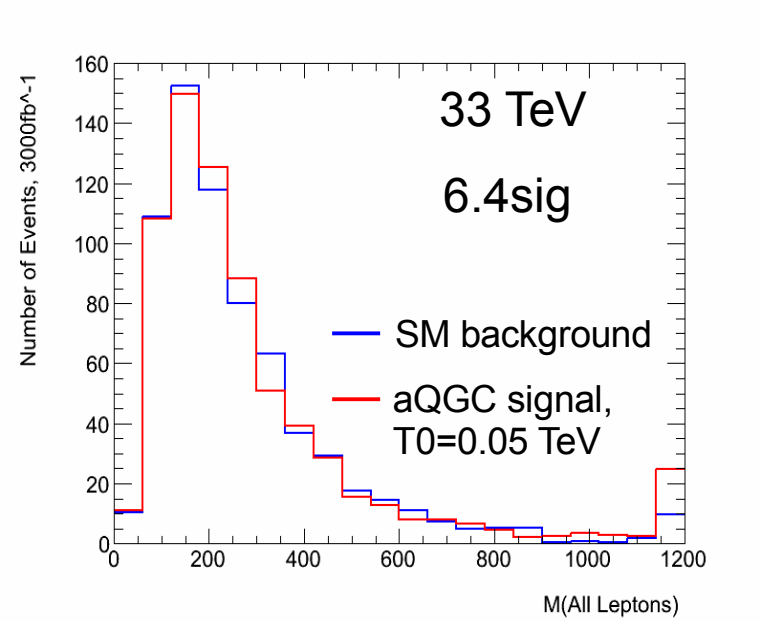
Low MC stats for blue hist.

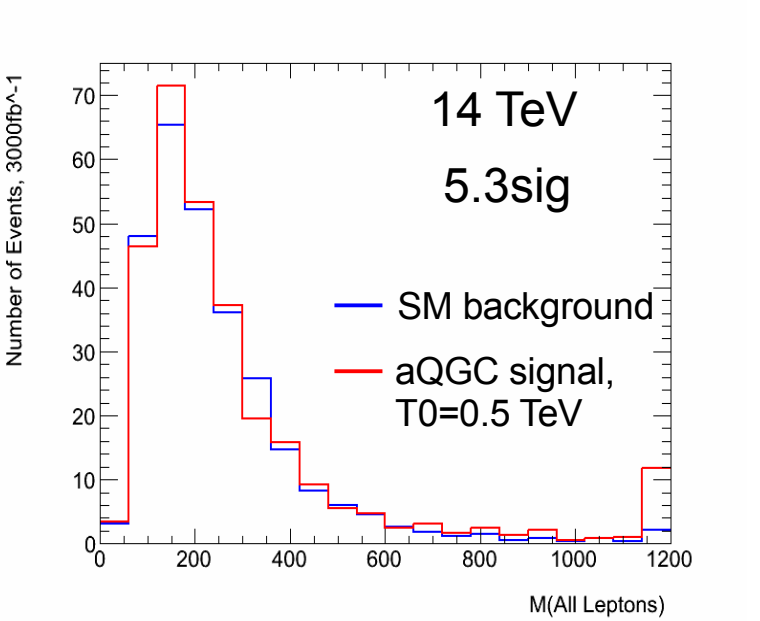




Other Values, No Pileup

- Halved previous coupling values for x10 increase in integrated luminosity, now significances ~5-6 again
- May have to step down again to reduce backgrounds a bit but still expect to be in this ballpark

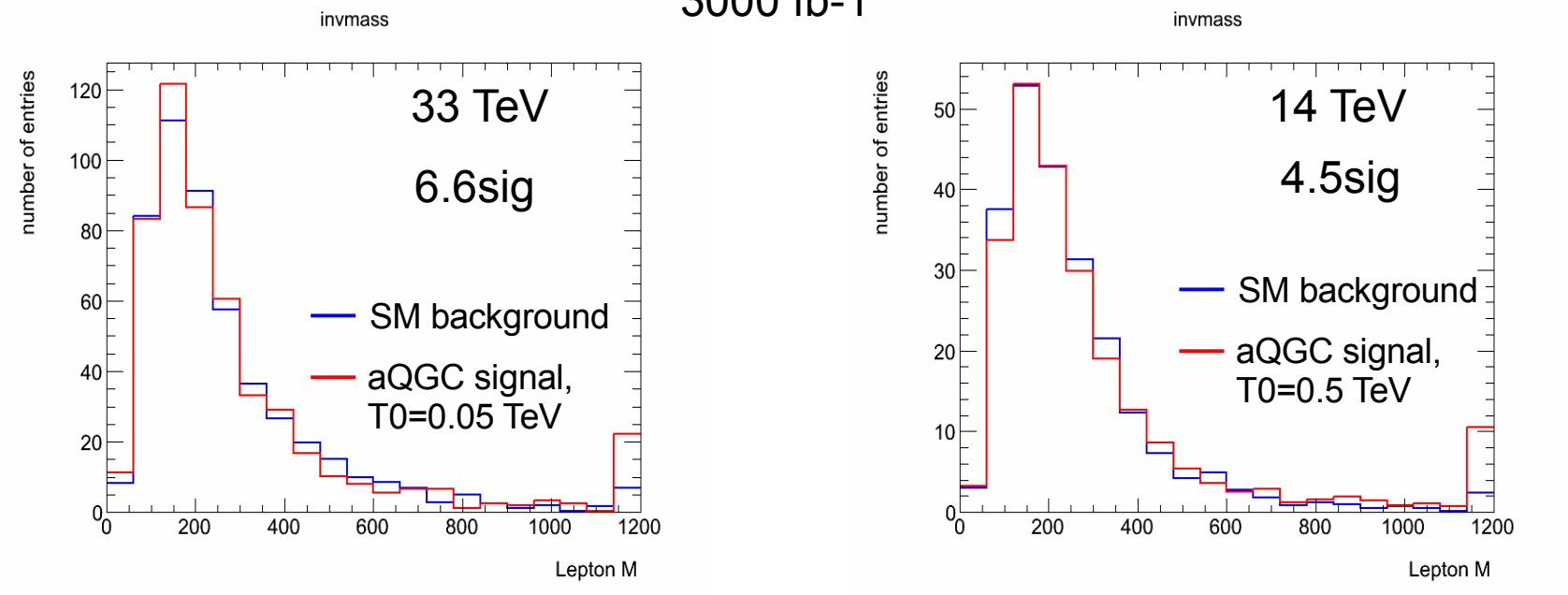




Other Values, With Pileup

- Halved previous coupling values for x10 increase in integrated luminosity, now significances ~5-6 again
- May have to step down again to reduce backgrounds a bit but still expect to be in this ballpark

3000 fb-1



To Do

- Try to finish background evaluation but might have to wait for after Seattle, will see how it goes
- How to implement unitarity?
- Other things for tomorrow?

Back up

Significance comment

- For plots on previous page I have

Rough estimate of Signifiance:
NSigma: 4.56803 p-val: 2.4617e-06

Frequentist significance: MCerr = 0:
NSigma: 4.55655 pval = 2.6e-06

Frequentist significance MCErr= 1:
Data LLR -10.4334
NSigma: 3.22989 pval = 0.0006192

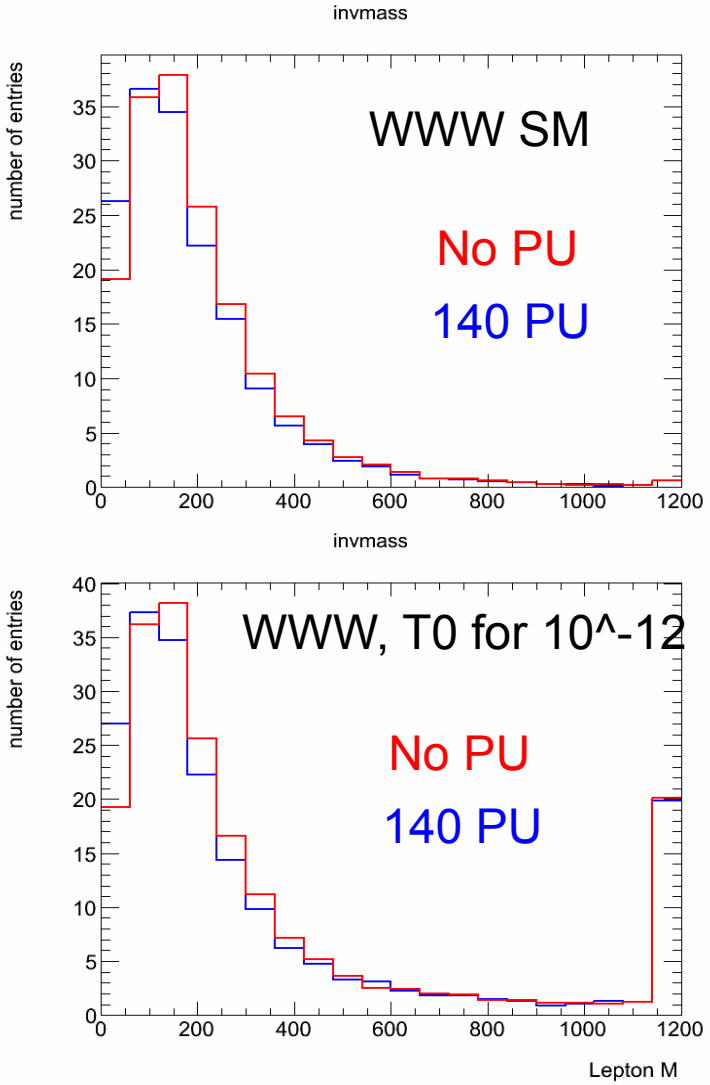
Rough estimate of Signifiance:
NSigma: 6.57776 p-val: 2.38791e-11

Frequentist significance: MCerr = 0:
Data LLR -21.6335
NSigma> 5.19934 pval < 1e-07

Frequentist significance MCErr= 1:
Data LLR -21.6335
NSigma: 4.70013 pval = 1.3e-06

Pileup, Fewer Cuts, 14 TeV, 300fb-1

- Is push of events towards higher energies with the 140 PU scenario for 14 TeV
- These plots include no explicit special requirements (but of course invariant mass not sensible if there aren't leptons, so some implicit cuts)



Cross-sections and Ratio wrt SM for 10^-11 Couplings

Coupling	WWW	WWZ	WZZ	ZZZ
Sm Cross-section(pb)	0.000568000	0.000111800	0.000009634	0.000000972
sm/sm	1.00	1.00	1.00	1.00
fs0/sm	1.00	1.00	1.00	1.00
fs1/sm	1.00	1.00	1.00	1.00
fm0/sm	1.49	1.09	1.05	1.02
fm1/sm	1.18	1.02	1.04	1.03
fm2/sm	1.00	1.05	1.00	1.02
fm3/sm	1.00	1.01	1.00	1.01
ft0/sm	19.10	4.23	3.38	2.90
ft1/sm	15.88	2.23	2.83	2.90
ft2/sm	4.61	1.33	1.35	1.54
ft8/sm	1.00	1.00	1.00	1.31
ft9/sm	1.00	1.00	1.00	1.08