Investigation of Most Sensitive Variables for HWW

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Outline

- Procedure (reminder)
- Status
- Results for Non-LR
- Status of LR-only and results thusfar
- Status of LR+Non-LR and results thusfar
- Summary and Conclusions

Procedure

Goals:

- Develop understanding of the interplay of the input variables
- Develop understanding of the interaction of ME and non-ME
- Obtain the best combination of variables.
- Understand the Ranking estimators.

Procedure:

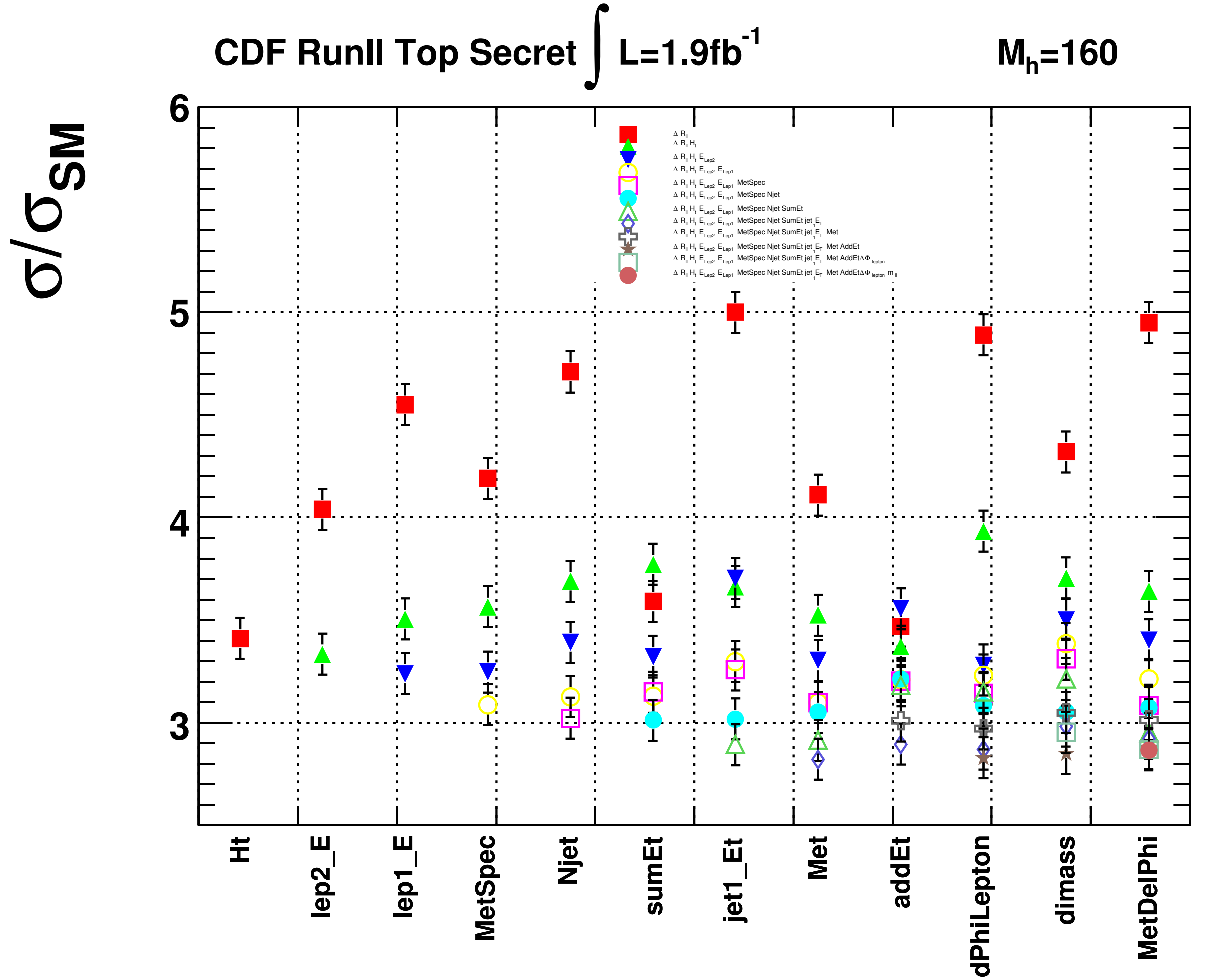
- Separately study LR, NonLR and combined, starting with Non-LR.
- Compute "Separation" of NonLR NN input variables and take largest.

- Do full analysis through to fitting for all Non-LR pairs. Pick the pair with the best sensitivity, $\frac{\sigma}{\sigma_{SM}}$. Examine Training, Sensitivity, (observed limit), NN distribution for all masses.
- Repeat with triplets, quadruplets, etc.
- Repeat with LR alone, then with mix.

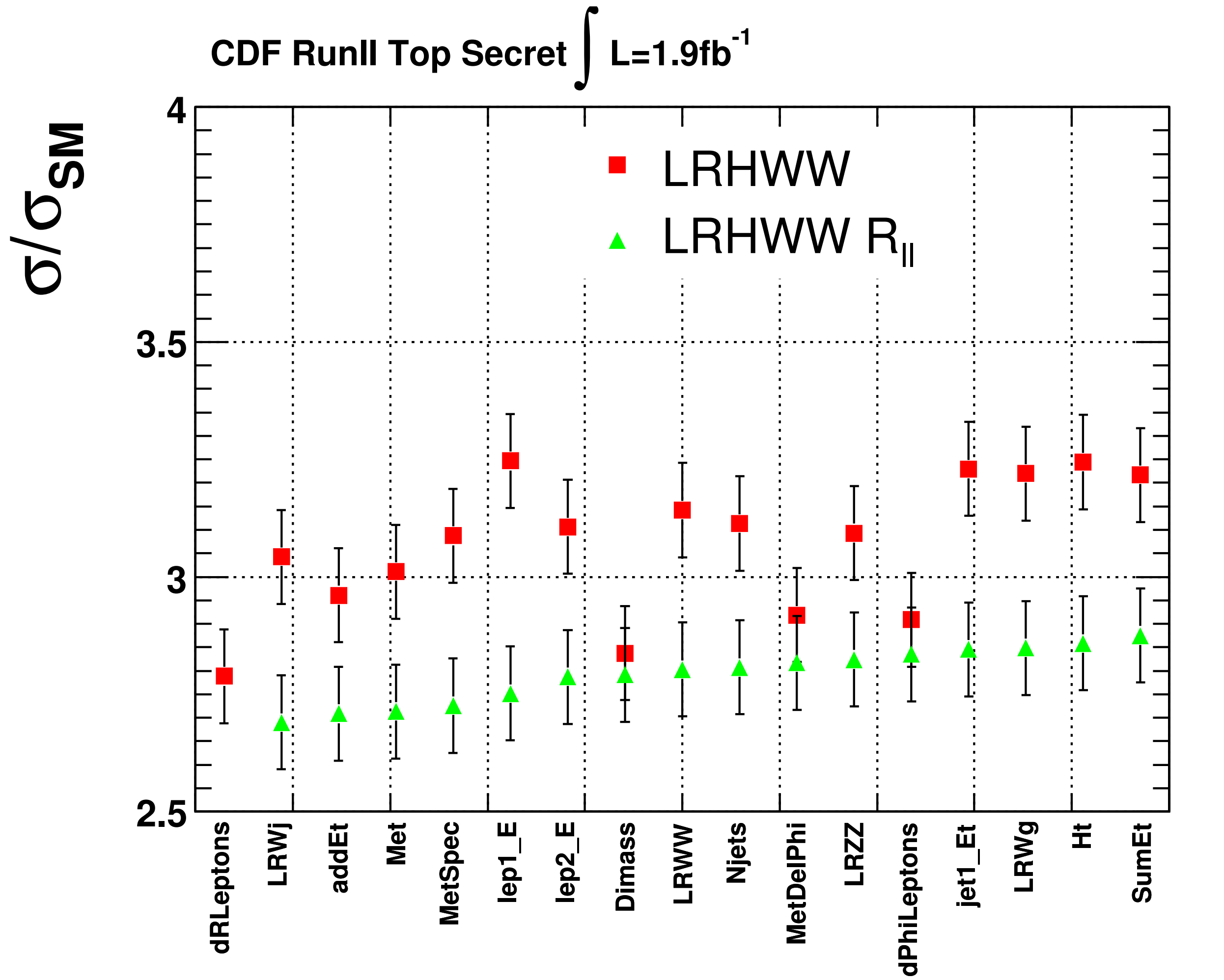
Notes

- Full analysis through to Observed sensitivity done for all combinations and available on web.
- Have all convergence plots and stacked NN plots on web as well.
- Study done with weighted backgrounds and MC@NLO.

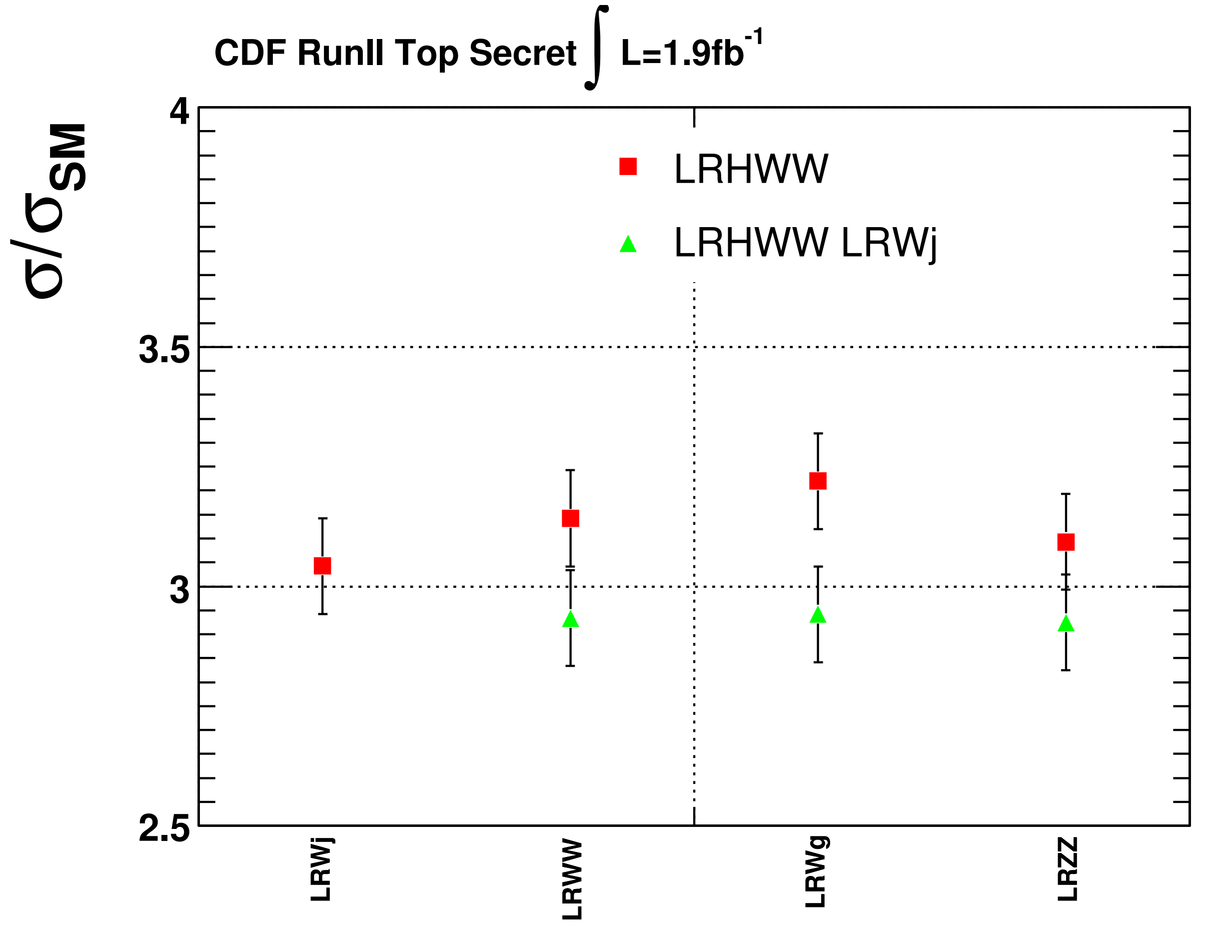
NonLR: Sensitivity at $M_h = 160$ GeV/c^2



LR and NonLR: Sensitivity at $M_h = 160$ GeV/c^2


CDF RunII Top Secret ∫ L=1.9fb^-1
σ/σ_SM
4
3.5
3
2.5
LRHWW
LRHWW R_ll
dRLeptons
LRWj
addEt
Met
MetSpec
lep1_E
lep2_E
Dimass
LRWW
Njets
MetDelPhi
LRZZ
dPhiLeptons
jet1_Et
LRWg
Ht
SumEt

LR-Only: Sensitivity at $M_h = 160$ GeV/c^2



Summary and Conclusions (thusfar)

- NonLR variables reach 2.8 with 8 variables: $\Delta R_{\ell\ell}$, H_t, E_{lep2}, E_{lep1} ,MetSpec, NJet, sumEt, Et_{jet1}, Met. After that addEt, $\Delta\phi_{\ell\ell}$, $M_{\ell\ell}$, MetDelPhi are within statistical noise
- LR variables reach 2.9 with 3 variables: LRHWW and LRWj with any of the others. Will carry on (even with statistical noise) to finish off all 5.
- LR and NonLR combined reach 2.7 with 3 variables: LRHWW, $\Delta R_{\ell\ell}$, and MetSpec. Carrying on to see if the rest are all within statistical noise.
- All masses done, extracting information for scripts. Hopefully done for next week.
- Should repeat with Neurobayes but need NB settings to run sets.