Summary of the 1L3B channel in ttbar-decay

- Baseline selection (optimized with OptimalCut tool, based on s/sqrt(s+b)):
  - == 1 lepton (e/μ), P_T > 30 GeV
  - >= 3 jets, P_T > 40/40/35 GeV
  - >= 3 CSVM b-tagged jets
  - M_T(lep,MET) > 50 GeV
- Number of events after baseline:
  - Signal: ~20 k events
  - Ttbar: ~217 k events
- MVA study completed: No discriminating kinematic variables found to base an MVA upon
- Discrimination power should be looked for in variables purely based on b-tagging information (e.g. # b-tagged jets, ~~b-discriminator~~)

Not available in our pheno study

Cutflow

	initial	== 1 lepton BL	>= 3 jets BL	>= 3 CSVM jets BL	Mt(lep,Met) > 50 GeV BL	Final
Signal	6.26e+05 ± 311	1.32e+05 ± 140	1.1e+05 ± 128	3.4e+04 ± 71.4	2.19e+04 ± 57.3	1.98e+04 ± 54.5
T+jets	2.78e+07 ± 2.47e+04	3.38e+06 ± 7.88e+03	6.72e+05 ± 2.44e+03	1.41e+03 ± 85.3	963 ± 76.4	575 ± 41.3
TT+V+jets	1.41e+04 ± 25.7	4.35e+03 ± 13.6	3.2e+03 ± 12	157 ± 2.74	94.1 ± 2.18	87 ± 2.1
TT+jets	3.91e+07 ± 8.15e+03	1.36e+07 ± 4.93e+03	9.23e+06 ± 4.11e+03	3.93e+05 ± 850	2.56e+05 ± 686	2.17e+05 ± 632
TTH	1.44e+04 ± 13.9	5.36e+03 ± 8.36	1.09e+03 ± 2.55	543 ± 1.8	392 ± 1.53	360 ± 1.47
W+jets	3.4e+08 ± 5.67e+04	7.82e+07 ± 2.95e+04	1.37e+07 ± 9.87e+03	3.99e+03 ± 139	2.74e+03 ± 115	1.91e+03 ± 93.7
ZToLL	1.29e+08 ± 2.93e+04	3.43e+07 ± 1.42e+04	2.86e+06 ± 2.89e+03	1.84e+03 ± 64.6	525 ± 30.9	329 ± 23.2

Significances

- Baseline selection:
  - S/sqrt(S+B) = **40.41**
  - S/sqrt(S+B+(0.1*ttbar)^2) = **0.91**
  - Template fit: no discriminating variable found to perform a sensible template fit upon
- Optimization with OptimalCut tool, based on S/sqrt(S+B+(0.1*B)^2):
  - >= 4 CSVT jets: S/sqrt(S+B+(0.1*B)^2) = **4.96**
  - Template fit doesn't make sense in such tight selection
- Under investigation: loosening cut on # CSVM jets from 3 to 2
  - Perform template fit on # CSVL jets