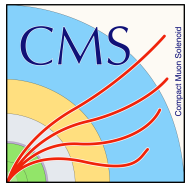


First SUSY plots

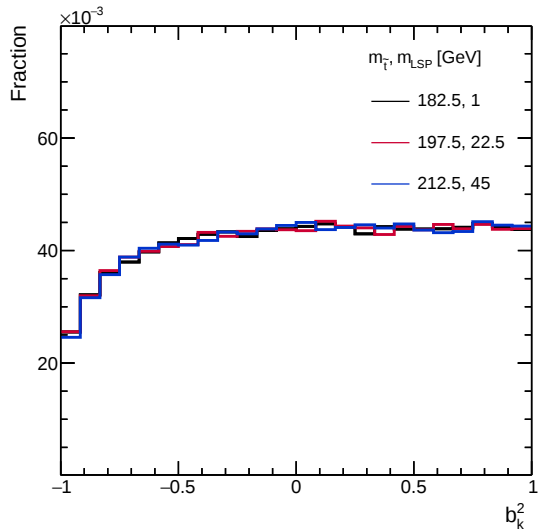
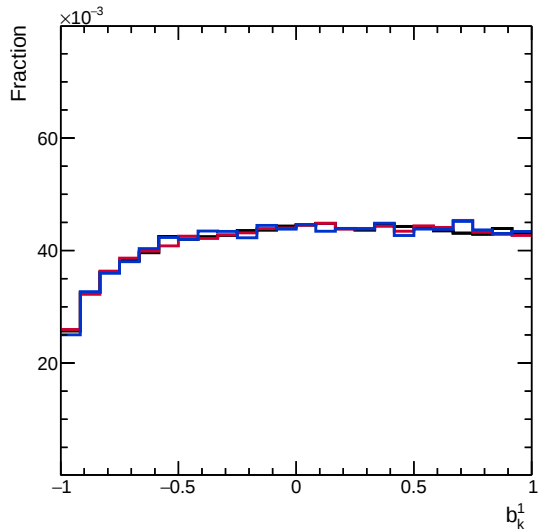
Afiq Anuar

23/03/2020

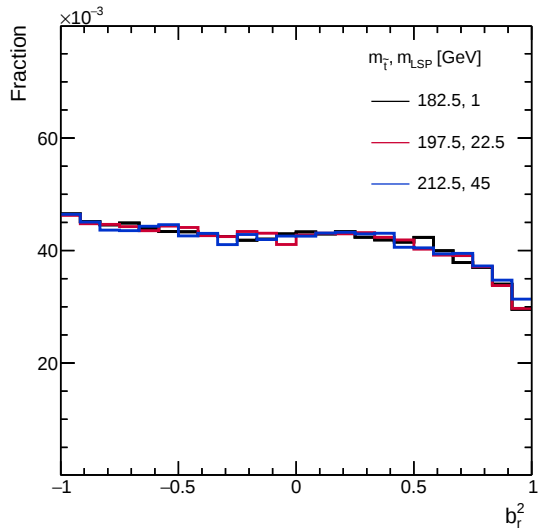
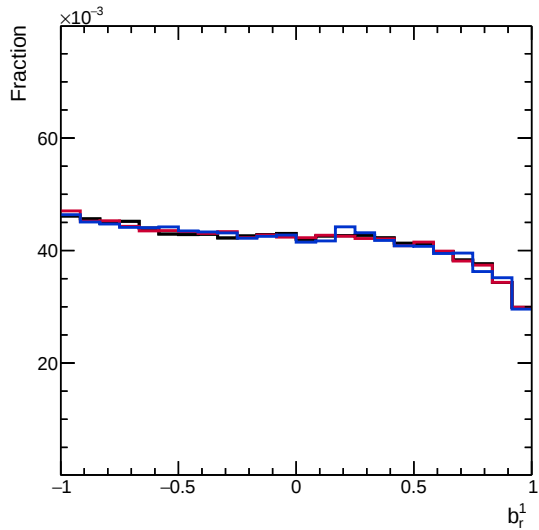


Introduction

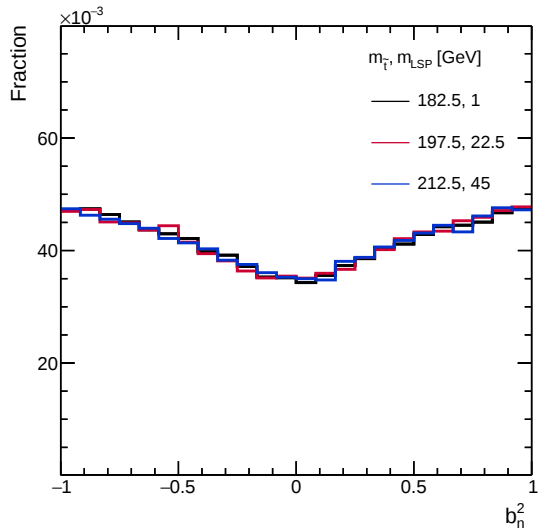
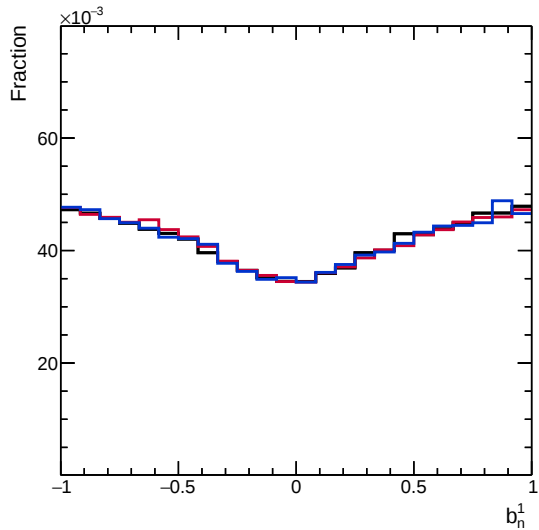
- Showing some plots from the SUSY sample I've been looking at
 - /SMS-T2tt_3J_xqcut-20_top-corridor_2Lfilter_TuneCUETP8M1_13TeV-madgraphMLM-pythia8/RunIISummer16MiniAODv2-PUMoriond17_GridpackScan_80X_mcRun2_asymptotic_2016_TracheIV_v6-v2/MINIAODSIM
- All plots are gen-level without acceptance cuts and normalized to 1
 - Can someone point me to the correct cross sections for each mass point?
 - Gen-level definitions reimplemented and validated using 2016 powheg $t\bar{t}$ sample



Very strange acceptance-like shoulder, seemingly no dependence on mass points.

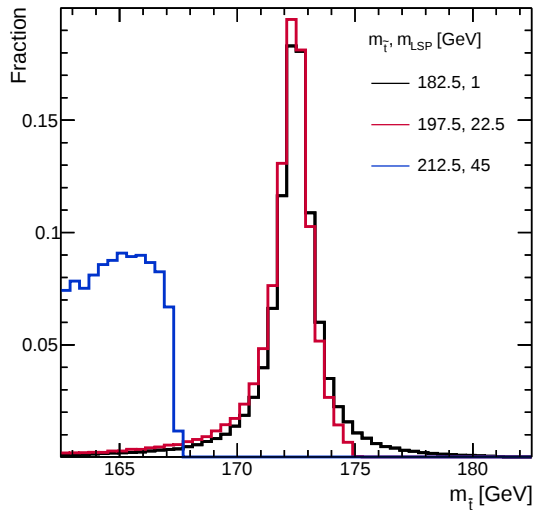
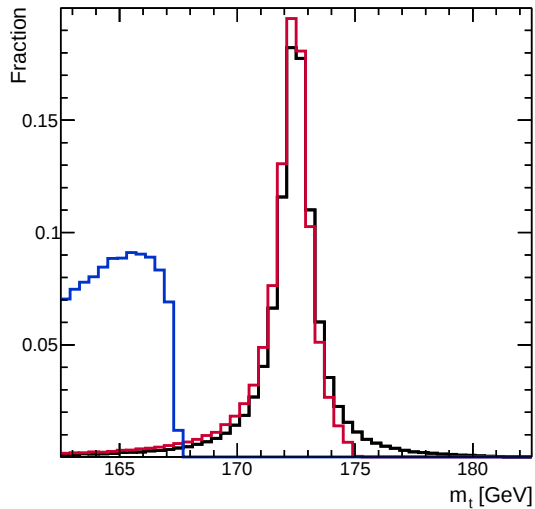
b_r^a 

Also in other variables...

b_n^a 

Also in other variables...

Top masses

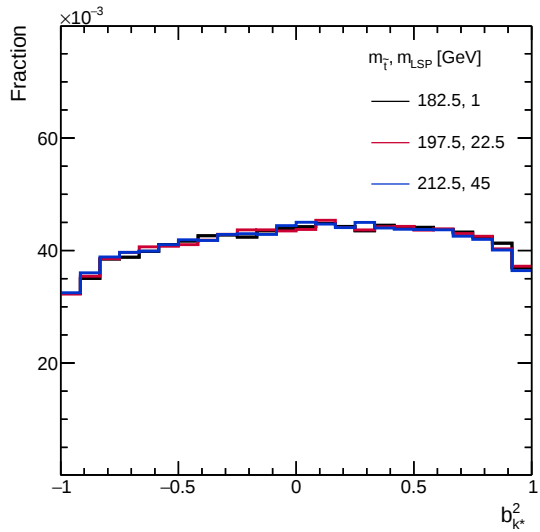
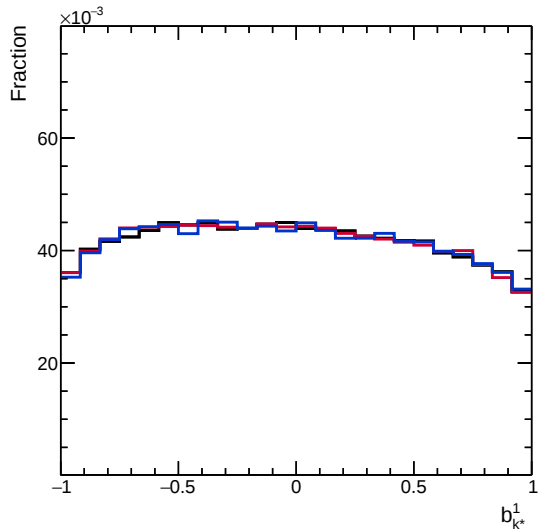


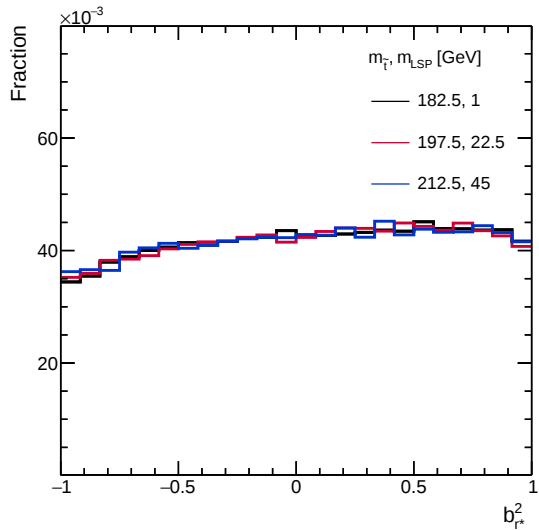
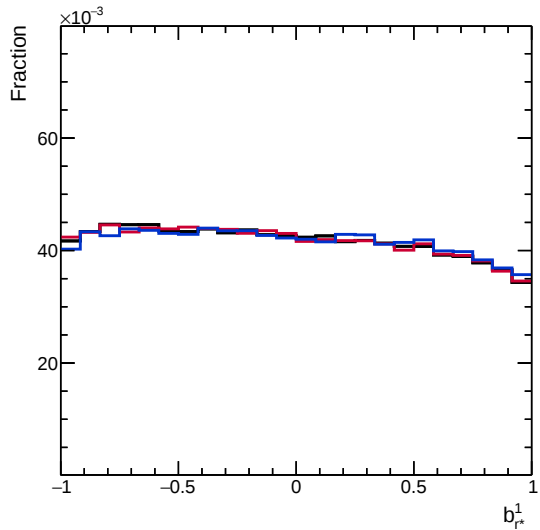
Apparently the shoulder is there even on points with on-shell tops.

Afterword

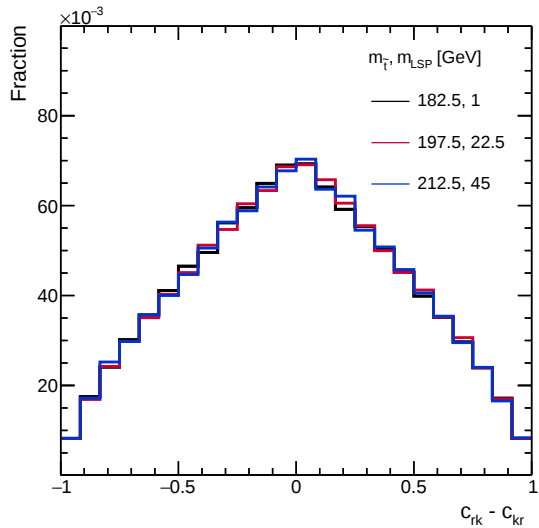
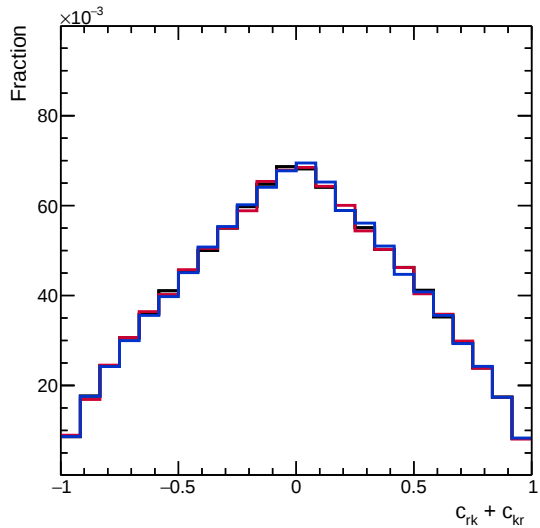
- The spin correlation plots are currently not understood
 - There seems to be some acceptance effects, but unclear where is the cut imposed
 - Also unclear why the b_k^a shoulder appears even on points where on-shell top is available
 - Top decayed by pythia in this sample, not sure if this is valid for spin correlation studies
 - Looking at e.g. $m_{\tilde{t}}, m_{\text{LSP}} = 212.5, 45\text{GeV}$, I'm also not fully sure about the kinematics
 - I am a SUSY newbie; I've no feeling on how these plots should look like
- For what it's worth I include all remaining variables I looked at in backup
 - There appears to be little mass dependence on spin correlation
 - Also on $\Delta\eta_{\ell\ell}$, isn't it supposed to be sensitive?
- Would like to clarify all these points before going further with any interpretation

Backup

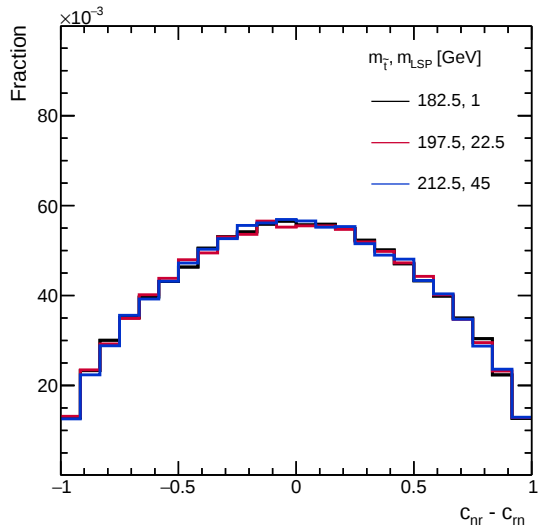
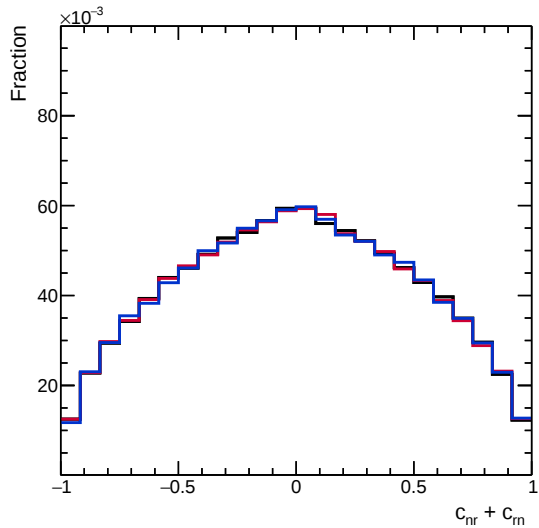
$b_{k^*}^a$ 

$b_{r^*}^a$ 

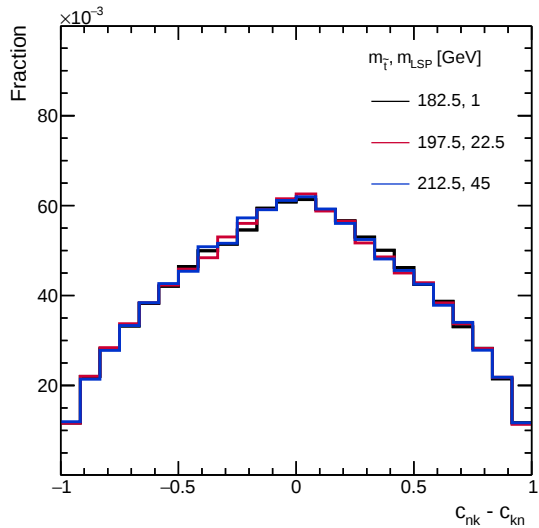
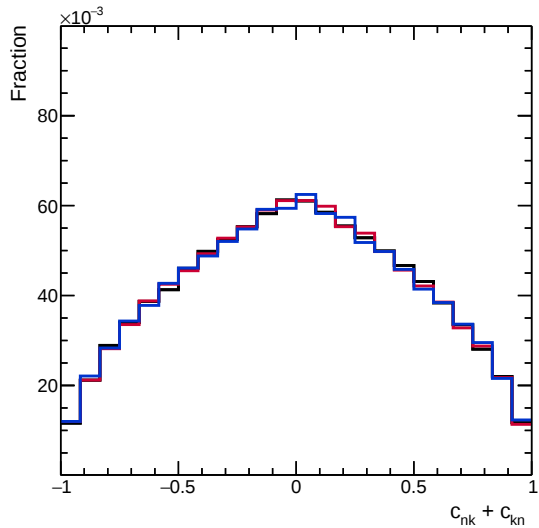
$$c_{rk} \pm c_{kr}$$



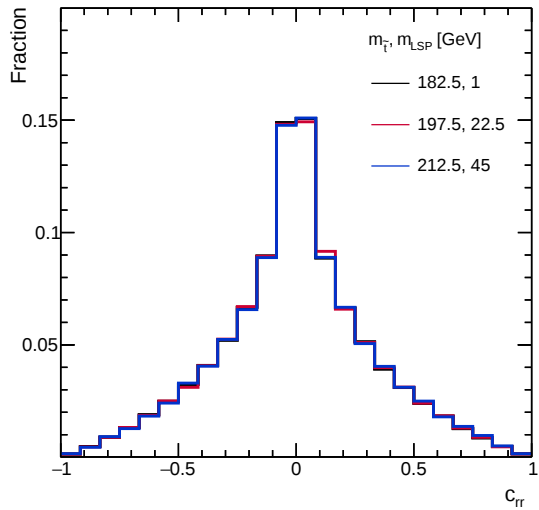
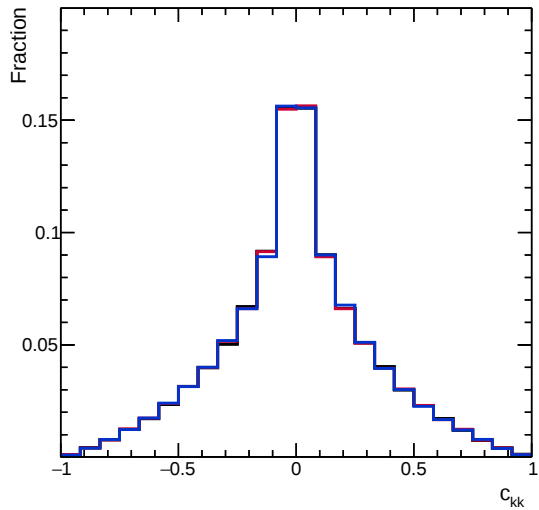
$$c_{nr} \pm c_{rn}$$



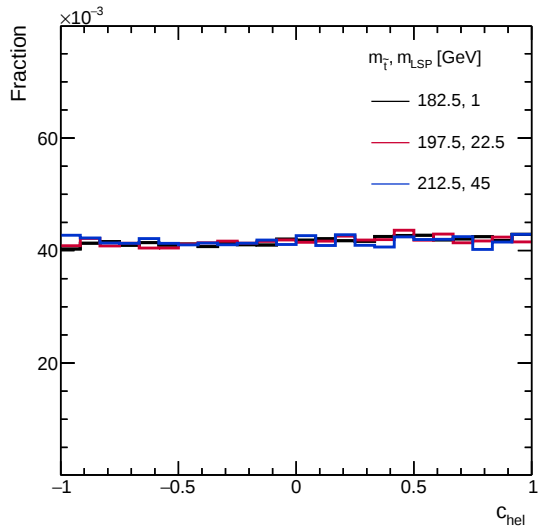
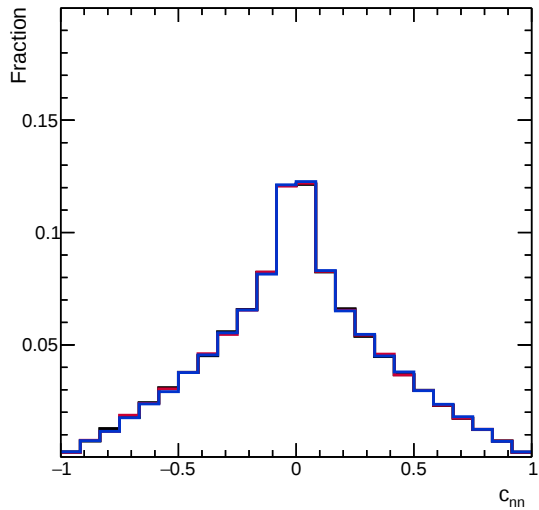
$$C_{nk} \pm C_{kn}$$



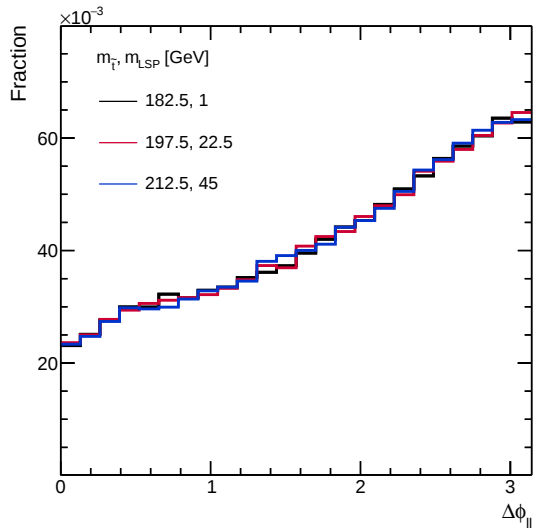
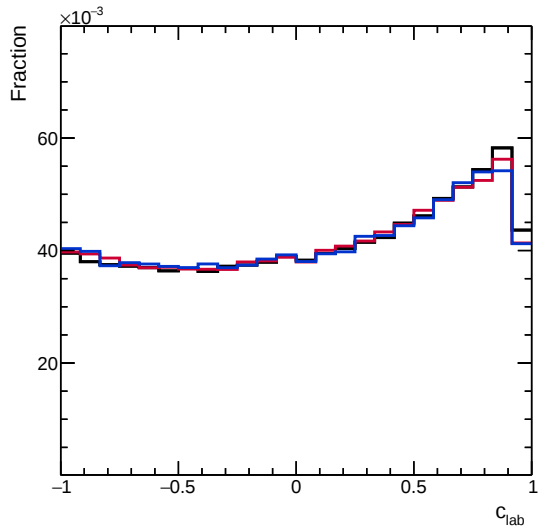
C_{kk} , C_{rr}



C_{nn} , C_{hel}



$c_{\text{lab}}, \Delta\phi_{\ell\ell}$



$$\Delta\eta_{\ell\ell}, p_T^\ell$$

