

Plans for $t\bar{t}$ background estimation

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Please give us an updated List @ (SUSY-UHH)

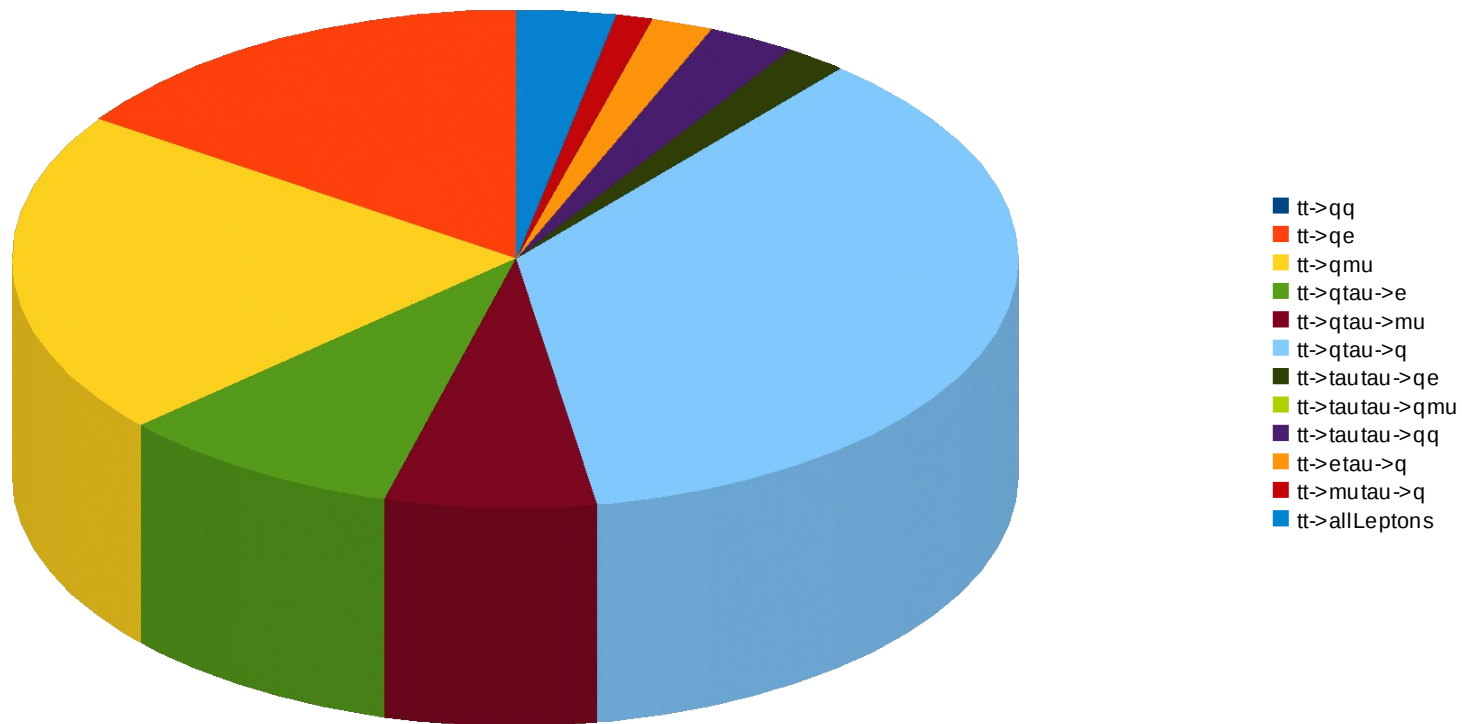


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Overview of background channels



- Semileptonic channel dominant
- τ -channel gives most background, especially when decaying hadronically

Hadronic channel:

- No remaining background expected and would show up in QCD estimate

Semileptonic channel:

- Lepton is a τ -lepton
 - Lepton decays hadronically (->important channel, some studies done by Maria)
 - Lepton decays in lighter leptons (->similar to other semileptonic channels.
X-sec smaller, but also lepton P_t smaller therefore often not vetoed)
- Lepton is a light lepton (electron or muon)
 - Scale by inefficiencies due to (see details later this talk):
 - Not ID'ed, usually due to small lepton P_t ($\sim 1/3$)
 - Not isolated ($\sim 2/3$)
 - Lepton in associated b-jet due to strong top-boost
 - Lepton in any other jet
 - Not in detector acceptance (small effect)

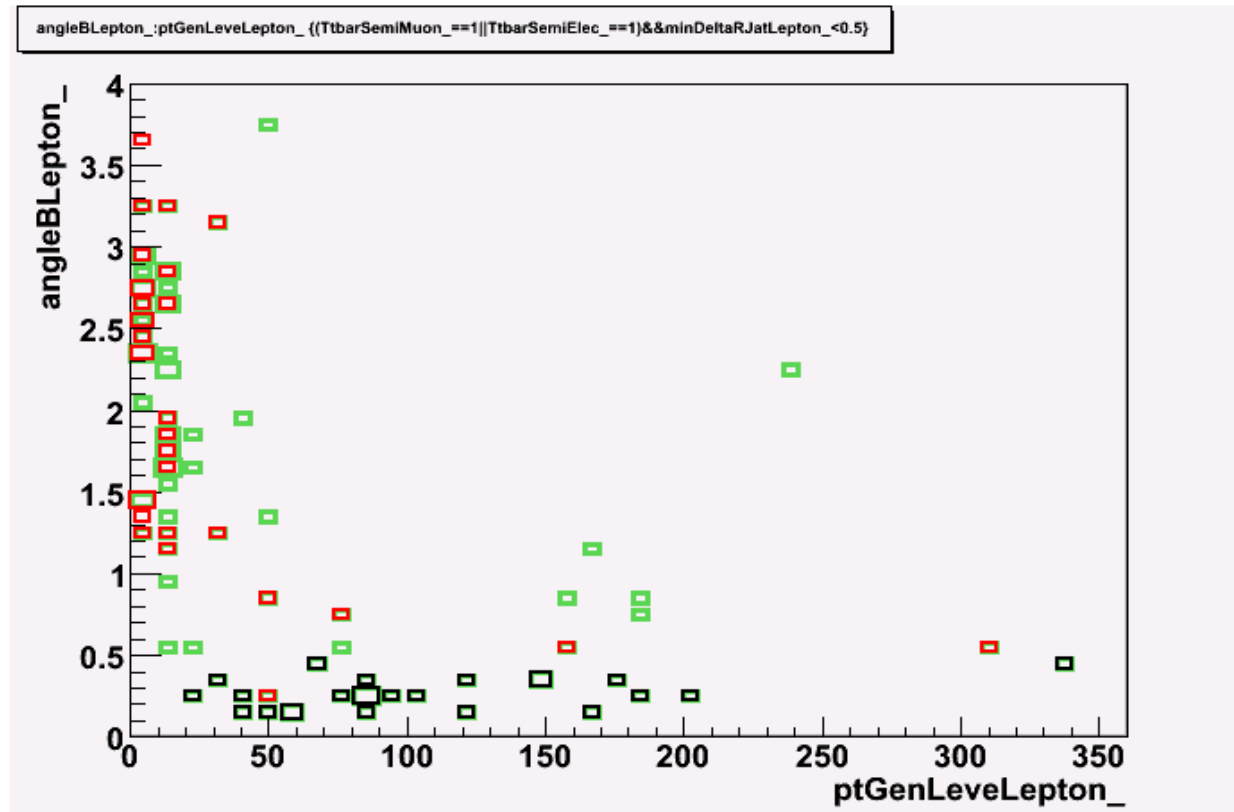
Dileptonic channel:

- Use efficiencies as in semileptonic channel. Expected to be $< 10\%$

Selecting semileptonic ttbar events

- Get clean semileptonic muon sample and use lepton universality
- No detailed analysis, yet but the punchline is:
 - Strategy similar to studies of Gent group, but with use of χ^2 -function, like in leptonic SUSY searches and top studies
<http://indico.cern.ch/getFile.py/access?contribId=0&resId=2&materialId=slides&confId=60206>
- To go from muon to other leptons use:
 - Spectrum of light Leptons from decaying τ -Leptons
 - Difference between (RECO) muon and electron spectrum due to Bremsstrahlung and multiple scattering

$$\chi^2 = (M_{jj} - M_W)^2 / (15.2 \text{ GeV})^2 + (M_{jjj} - M_T)^2 / (25 \text{ GeV})^2 + (M_{Wlj} - M_T)^2 / (31.2 \text{ GeV})^2$$



Black = in associated b-jet
Green = in any jet
Red = not ID'ed

- Only Events passing all RA2 SUSY cuts
- In jet means: $\Delta R < 0.5$
- All values on gen level except for η, Φ in “any jet”



Summary



- We have started an effort for a data driven top-background estimation
- All results preliminary
- Channels with a tau lepton are of great importance (done by Maria?)
- Leptons not passing isolation have a great impact, especially in events with highly boosted tops
- Many interesting questions to study
- Great importance to communicate with other groups