

Status report

Niklas Pietsch

SUSY-Meeting July 28th, 2009

- Samples:

- ▶ SUSY LM3
- ▶ SUSY LM3 (with a semi-muonic / di-muonic $t\bar{t}$ -decay in the event)
- ▶ Muon $t\bar{t}$ (with a semi-muonic / di-muonic $t\bar{t}$ -decay in the event)
- ▶ Other $t\bar{t}$
- ▶ ZPrime ($m = 750 \text{ GeV}$ / $m = 1000 \text{ GeV}$)
- ▶ QCD
- ▶ Z+jets
- ▶ W+Jets
- ▶ WW
- ▶ WZ
- ▶ ZZ

- Semileptonic preselection cuts:

- ▶ $|\eta(\text{muon1})| < 2.1$
- ▶ $|\eta(\text{jet})| < 2.4$ (4 leading jets)
- ▶ $\text{pt}(\text{jet1}) > 30 \text{ GeV}$
- ▶ $\text{pt}(\text{jet2}) > 30 \text{ GeV}$
- ▶ $\text{pt}(\text{jet3}) > 30 \text{ GeV}$
- ▶ $\text{pt}(\text{jet4}) > 30 \text{ GeV}$
- ▶ $(\sum_{\text{tracker}} \text{pt} + \sum_{\text{ecal.}} \text{pt} + \sum_{\text{hcal.}} \text{pt}) / \text{pt}(\text{muon1}) < 0.1$
- ▶ $dR(\text{leading Muon, leading Jet}) > 0.2$

- Semileptonic selection cuts:

- ▶ $M_T > 500 \text{ GeV}$

- Dileptonic preslection cuts:

- ▶ $|\eta(\text{muon1})| < 2.1$
- ▶ $|\eta(\text{muon2})| < 2.1$
- ▶ $\text{pt}(\text{muon1}) > 20 \text{ GeV}$
- ▶ $\text{pt}(\text{muon2}) > 20 \text{ GeV}$
- ▶ $|\eta(\text{jet1})| < 2.4$
- ▶ $|\eta(\text{jet2})| < 2.4$
- ▶ $E_t(\text{jet1}) > 40 \text{ GeV}$
- ▶ $E_t(\text{jet2}) > 40 \text{ GeV}$
- ▶ $(\sum_{\text{tracker}} \text{pt} + \sum_{\text{ecal.}} \text{pt} + \sum_{\text{hcal.}} \text{pt}) / \text{pt}(\text{muon1}) < 0.1$
- ▶ $(\sum_{\text{tracker}} \text{pt} + \sum_{\text{ecal.}} \text{pt} + \sum_{\text{hcal.}} \text{pt}) / \text{pt}(\text{muon2}) < 0.1$

- Dileptonic selection cuts:

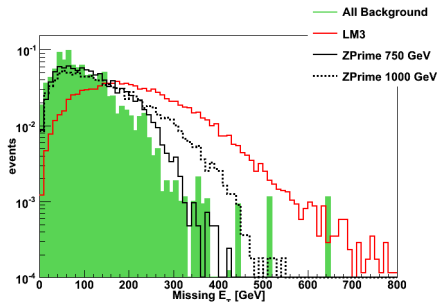
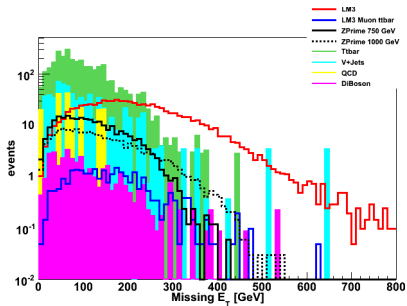
- ▶ $84 \text{ GeV} < \text{Di-Muon-mass} < 98 \text{ GeV}$

- After preslection cuts:

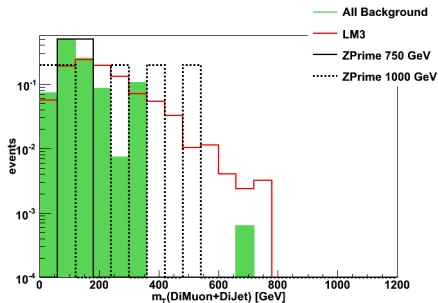
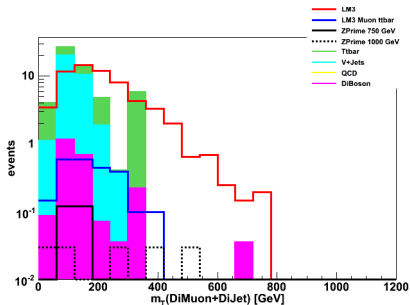
Deviations due to SUSY in the distributions of the following variables observable:

- ▶ E_T (Jets)
- ▶ HT
- ▶ MET
- ▶ MT
- ▶ Jet-multiplicities

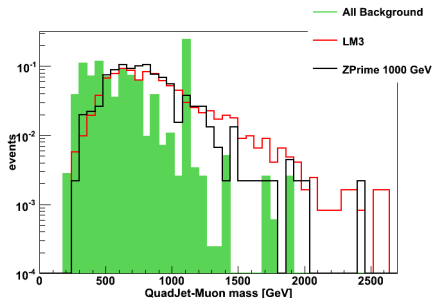
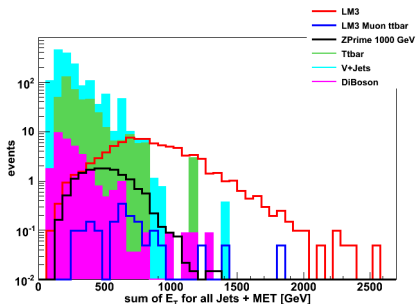
- ▶ “DiMuon-variables” in the semilept. channel
- ▶ “SemiMuon-variables” in the dilept. channel



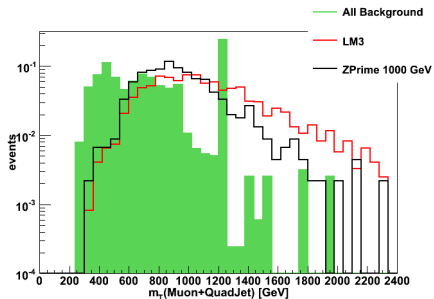
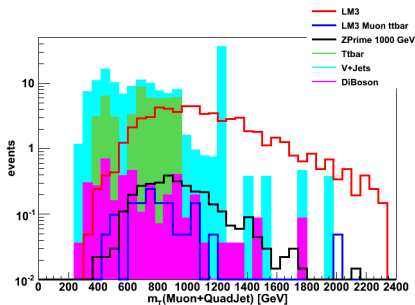
Missing E_T in the semilep. $t\bar{t}$ -decay-channel



inv. transverse DiMuon-DiJet-mass in the semilep. $t\bar{t}$ -decay-channel

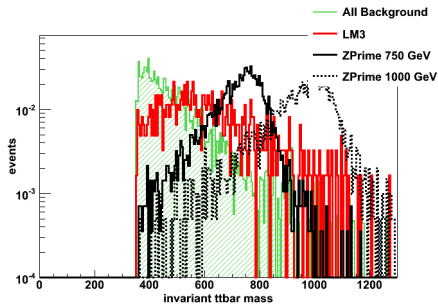
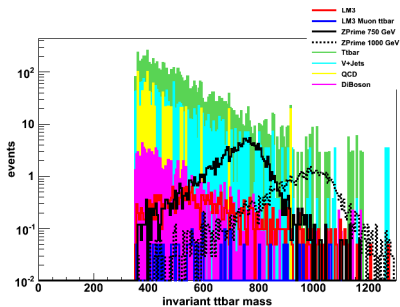


MT + Missing E_T in the dilep. $t\bar{t}$ -decay-channel

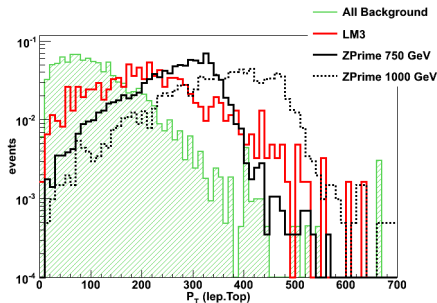
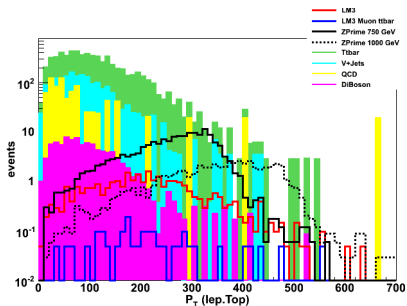


inv. transverse Muon-QuadJet-mass in the dilep. $t\bar{t}$ -decay-channel

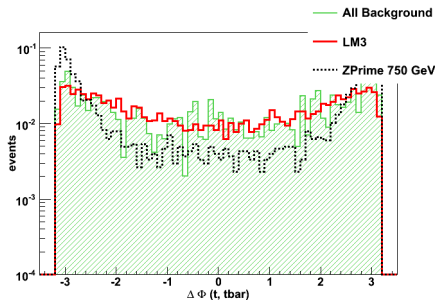
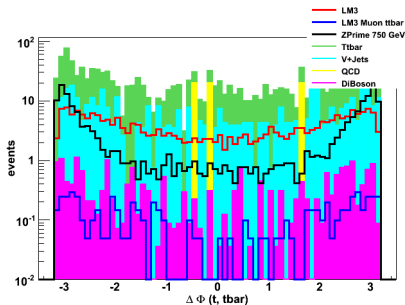
- Results of reconstruction



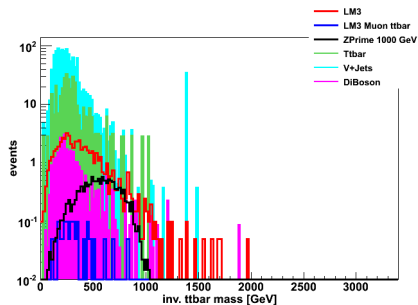
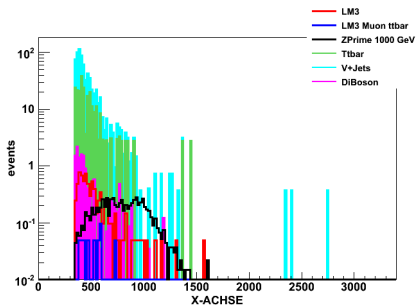
inv. $t\bar{t}$ -mass after KinFit with the 4 leading Jets



P_T (lep. Top) after KinFit with the 4 leading Jets



$\Delta\Phi(t\bar{t})$ after KinFit with the 6 leading Jets



inv. $t\bar{t}$ -mass in the dilep. $t\bar{t}$ -decay-channel

- To Do

- ▶ “correct” isolation-cut
- ▶ perform cut on E_T of Jet1 and Jet2 in the fulllep. channel
- ▶ increase luminosity ?
- ▶ add samples with Zprime masses of 2,3 and 4 TeV
- ▶ add LM1- and LM8- samples