QCD and EWK Background in lepton charge asymmetry

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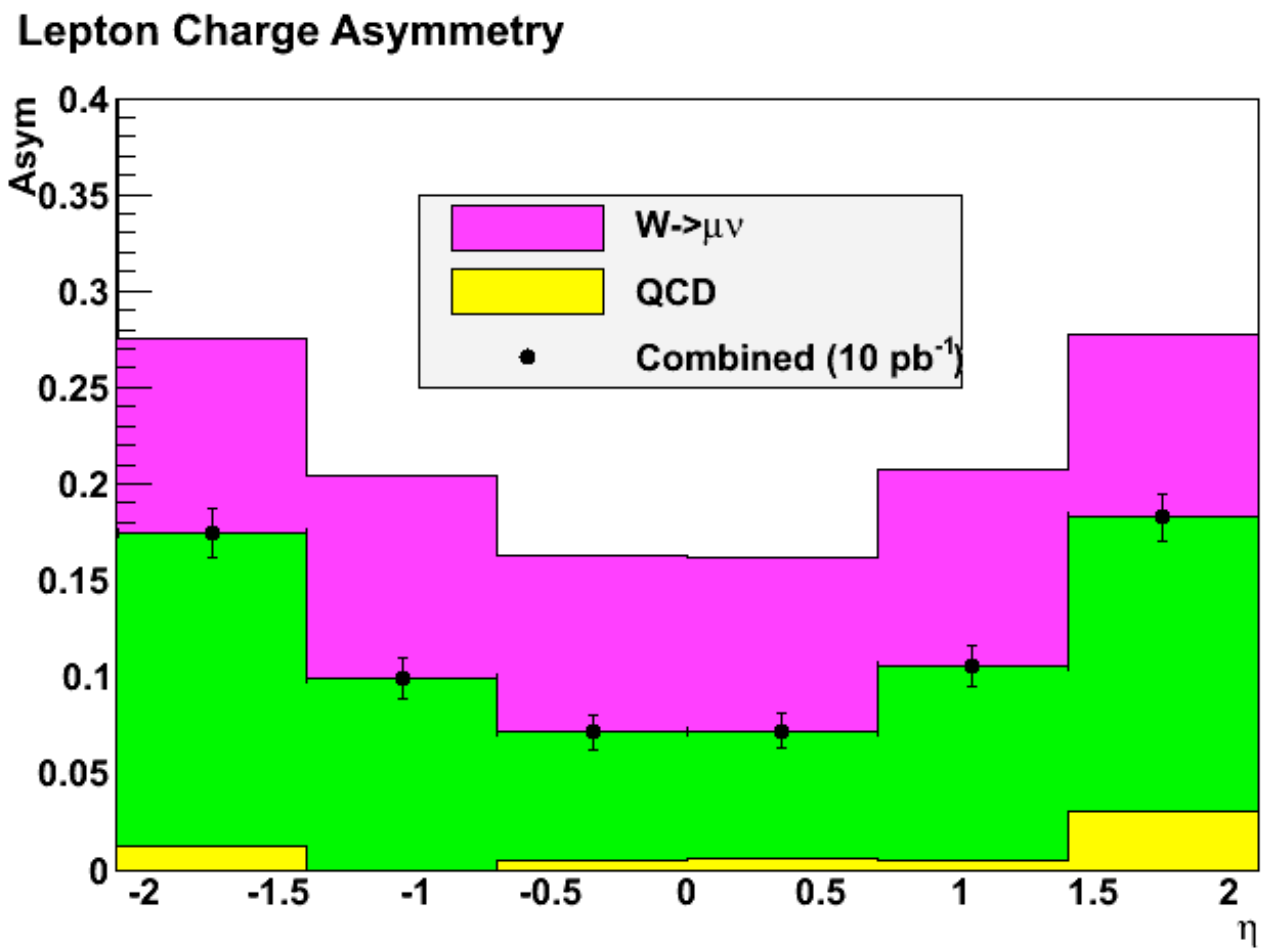
Data set and cuts

- Data sets
  - /Wmunu/Summer09-MC_31X_V3_7TeV-v1/GEN-SIM-RECO
  - /Zmumu/Summer09-MC_31X_V3_7TeV-v1/GEN-SIM-RECO
  - /InclusiveMu15/Summer09-MC_31X_V3/GEN-SIM-RECO
  - /Wtaunu/Summer09-MC_31X_V3_7TeV-v1/GEN-SIM-RECO
  - /Ztautau/Summer09-MC_31X_V3_7TeV-v1/GEN-SIM-RECO
- Preselections (GlobalMuon)
  - muons_pt>10.0
  - TMath::Abs(muons_eta)<2.4
  - muons_validHits>=11
  - muons_chi2<10.0
  - muons_muonHits>=16
- Cuts for muon for W
  - muons_pt>25
  - TMath::Abs(muons_eta)<2.1
  - Matching to HLT_Mu9 trigger object with deltaR<0.015
  - CaloMet> 20 GeV

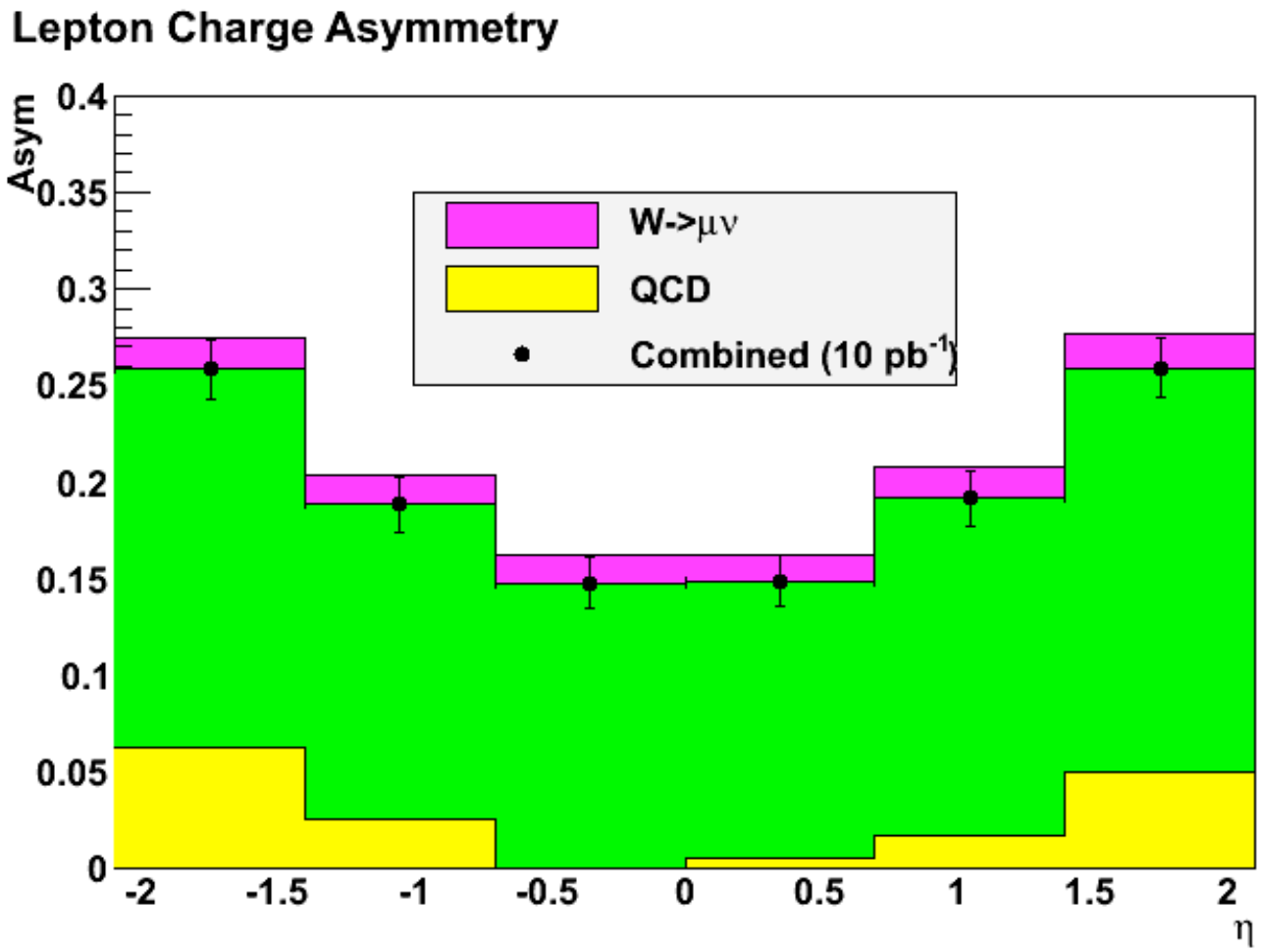
QCD contribution w/o iso cut

- QCD background contribution
  - isolation cut is not applied
  - background fraction : 103%
  - lepton charge asymmetry of QCD events is symmetric as expected



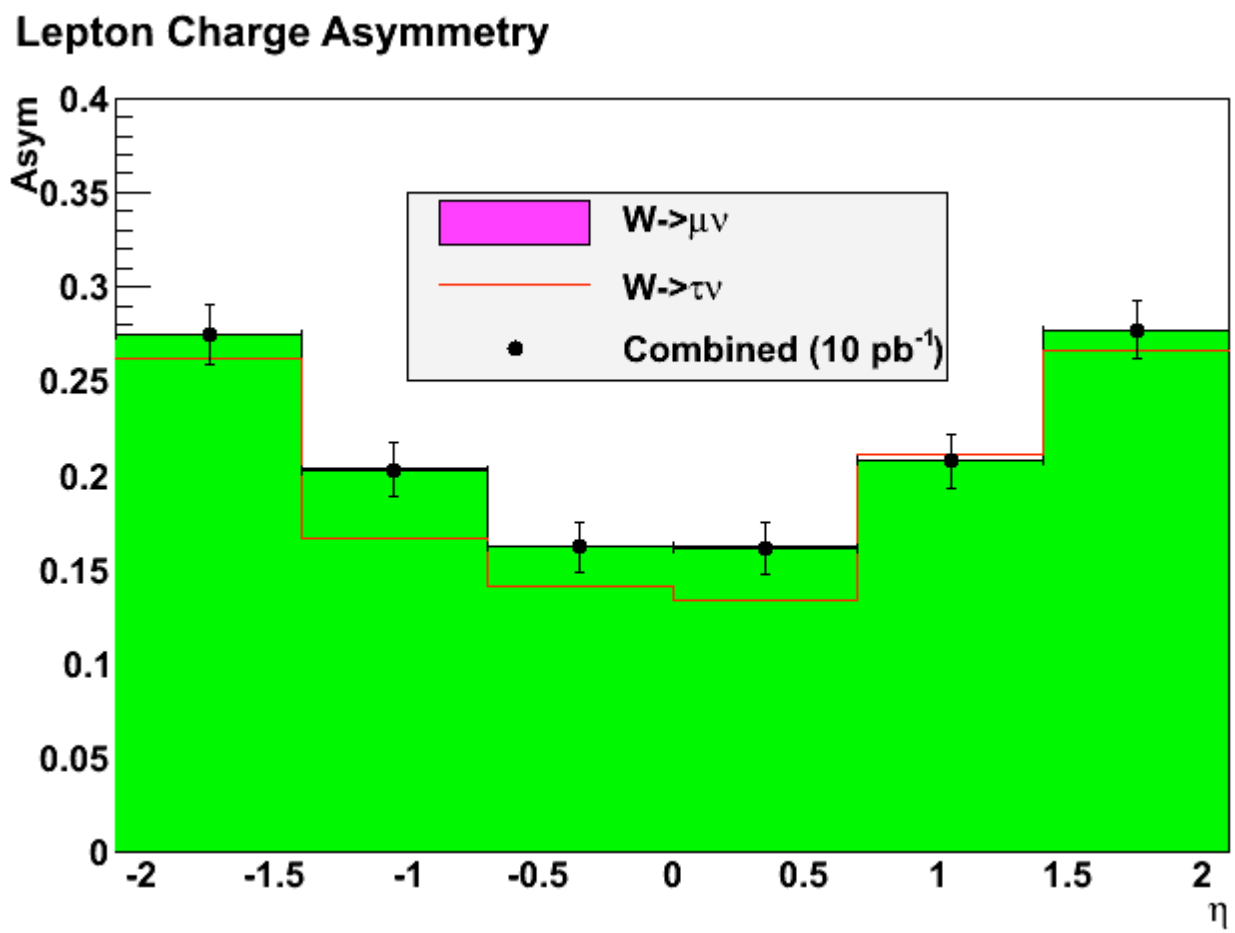
QCD contribution with iso<3

- QCD background contribution
  - isolation < 3 GeV is applied
  - background fraction : 9.1 %
  - QCD background shows asymmetry - need to understand



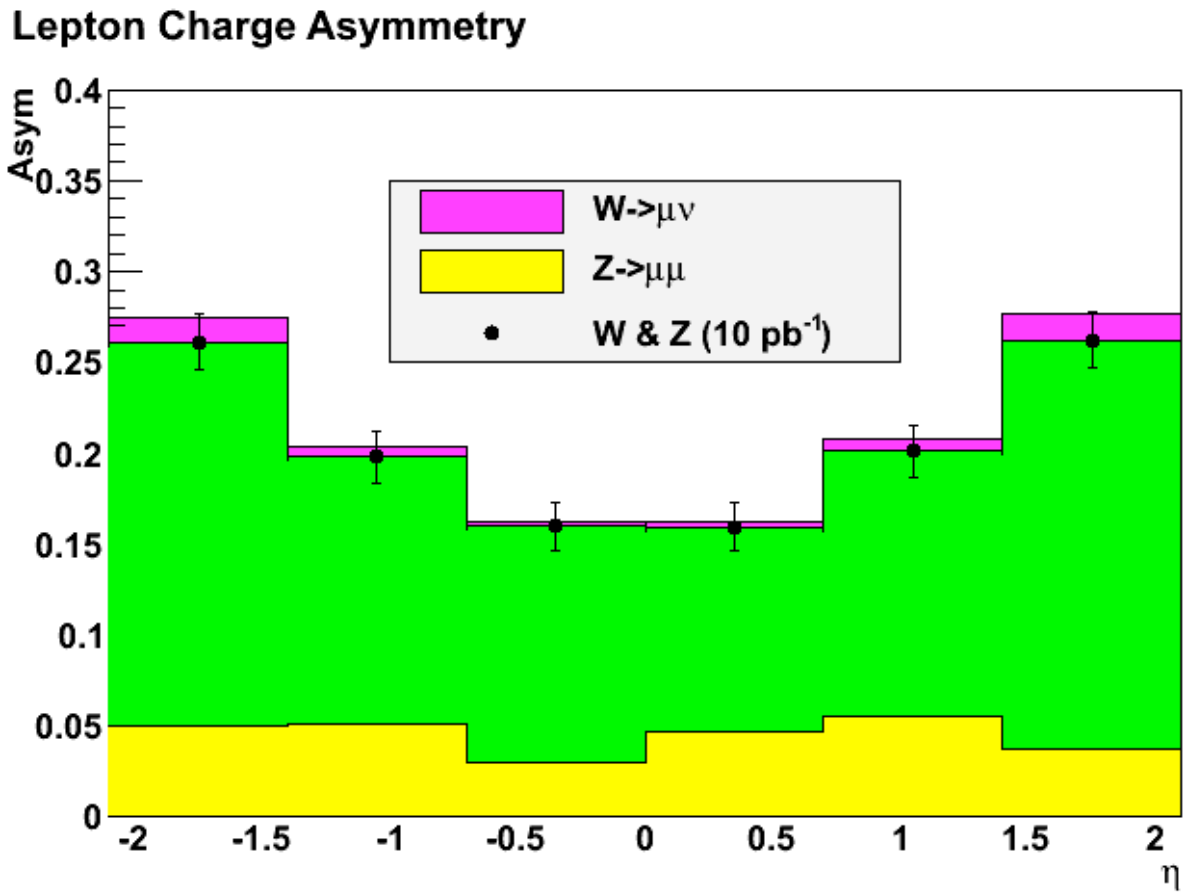
W→τν contribution

- W→τν contribution
  - W→τν also has a similar asymmetry with W→μν
  - W→τν background is very small : 0.46 % level
  - W→τν background contribution is negligible



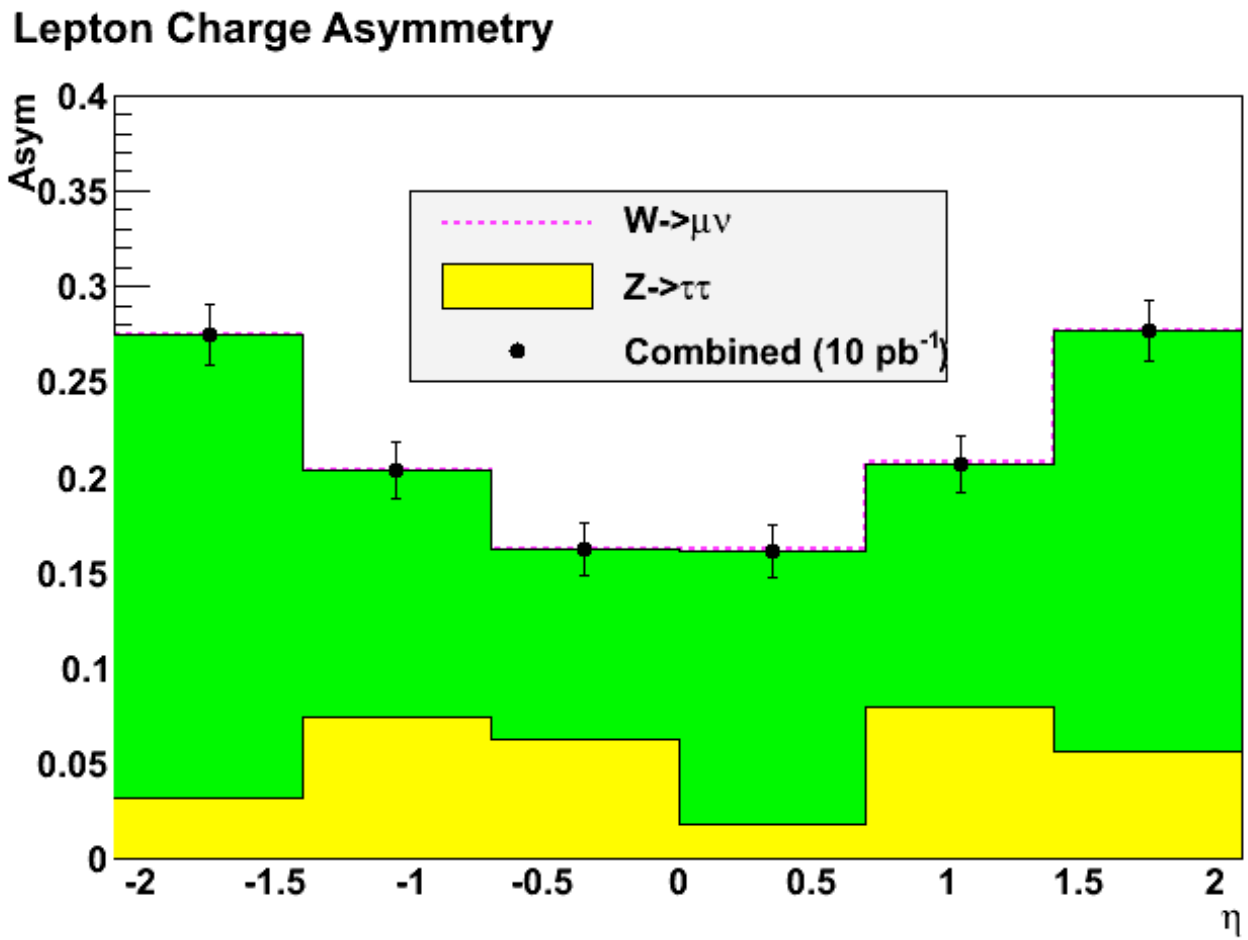
Z→μμ contribution

- Z→μμ contribution
  - Z→μμ events shows symmetric in η
  - Z→μμ background rate is 4.02 % in total



Z→τμ contribution

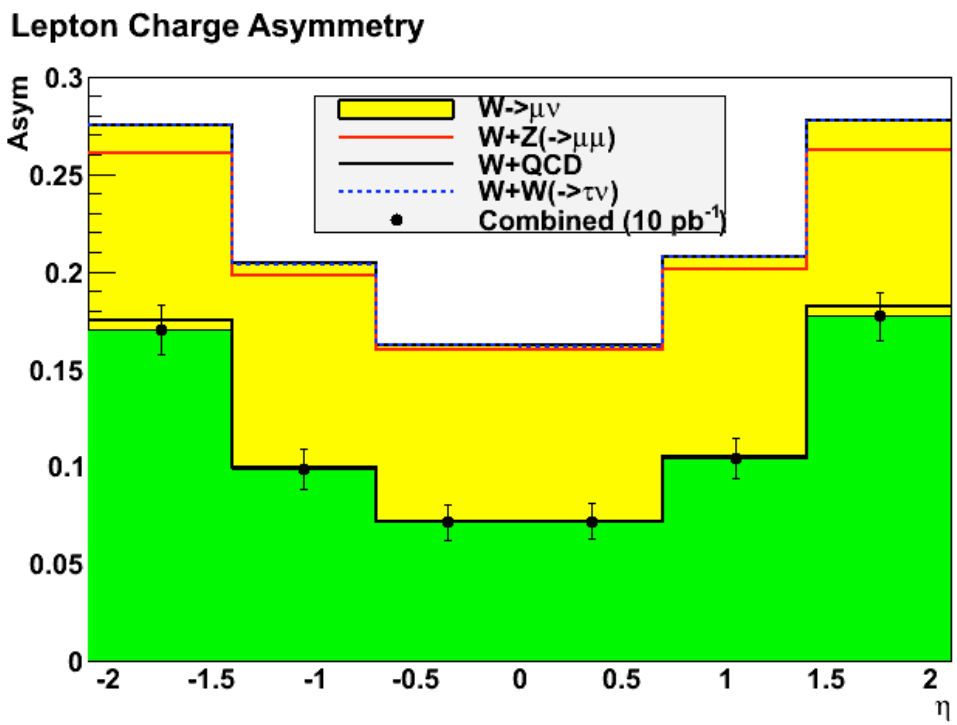
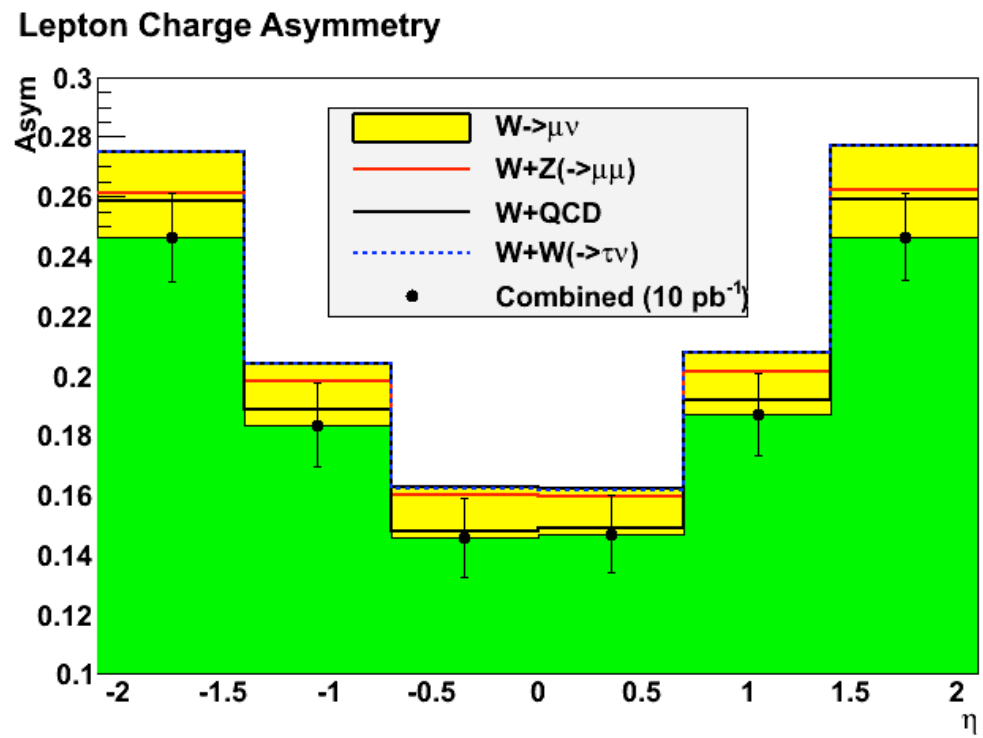
- Z→τμ contribution
  - Z→τμ contribution is very small
  - Z→τμ background rate is 0.23 % in total



Lepton charge Asymmetry

- Lepton charge asymmetry
  - QCD background gives a biggest effect in the lepton charge asymmetry
    - QCD background with iso cut shows asymmetry - need to understand
  - $Z \rightarrow \mu\mu$ also changes the asymmetry, but less than QCD background
  - $W \rightarrow \tau\nu$ contribution is negligible

no iso cut



with iso cut