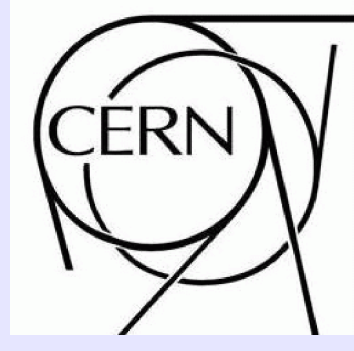
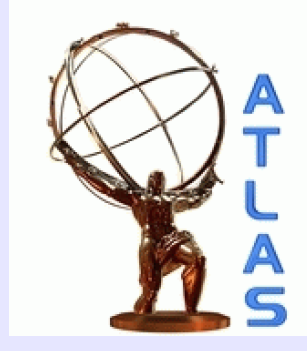


Inclusive Searches for Supersymmetry with Leptons with the ATLAS detector



Stephan Horner on behalf of the ATLAS Collaboration



Introduction

× If supersymmetry exists at the TeV scale it is expected to produce **final states with jets, large missing transverse momentum** and potentially **one or more isolated leptons** in proton-proton collisions at currently $\sqrt{s} = 7$ TeV

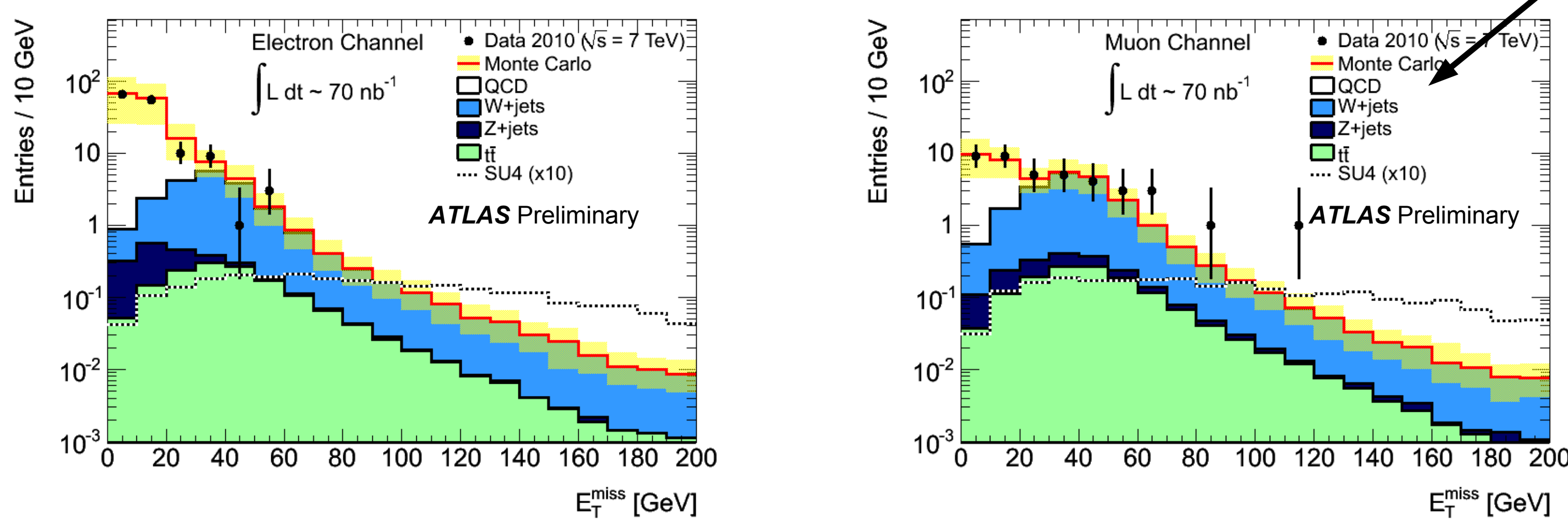
× Select events with at least two jets with transverse momentum (p_T) > 30 GeV, one lepton with $p_T > 20$ GeV and missing transverse energy greater than 30 GeV

× Check distributions of the following variables, believed to be sensitive for supersymmetry, for significant deviations from the Standard Model prediction:

- Missing transverse energy (E_T^{miss})
- Effective mass (M_{eff}): Scalar sum of both jets p_T s, lepton p_T and missing transverse energy
- Transverse mass (m_T): Invariant mass of lepton and missing energy in the plane transverse to the beam

1 Lepton Channel

Missing energy distributions:

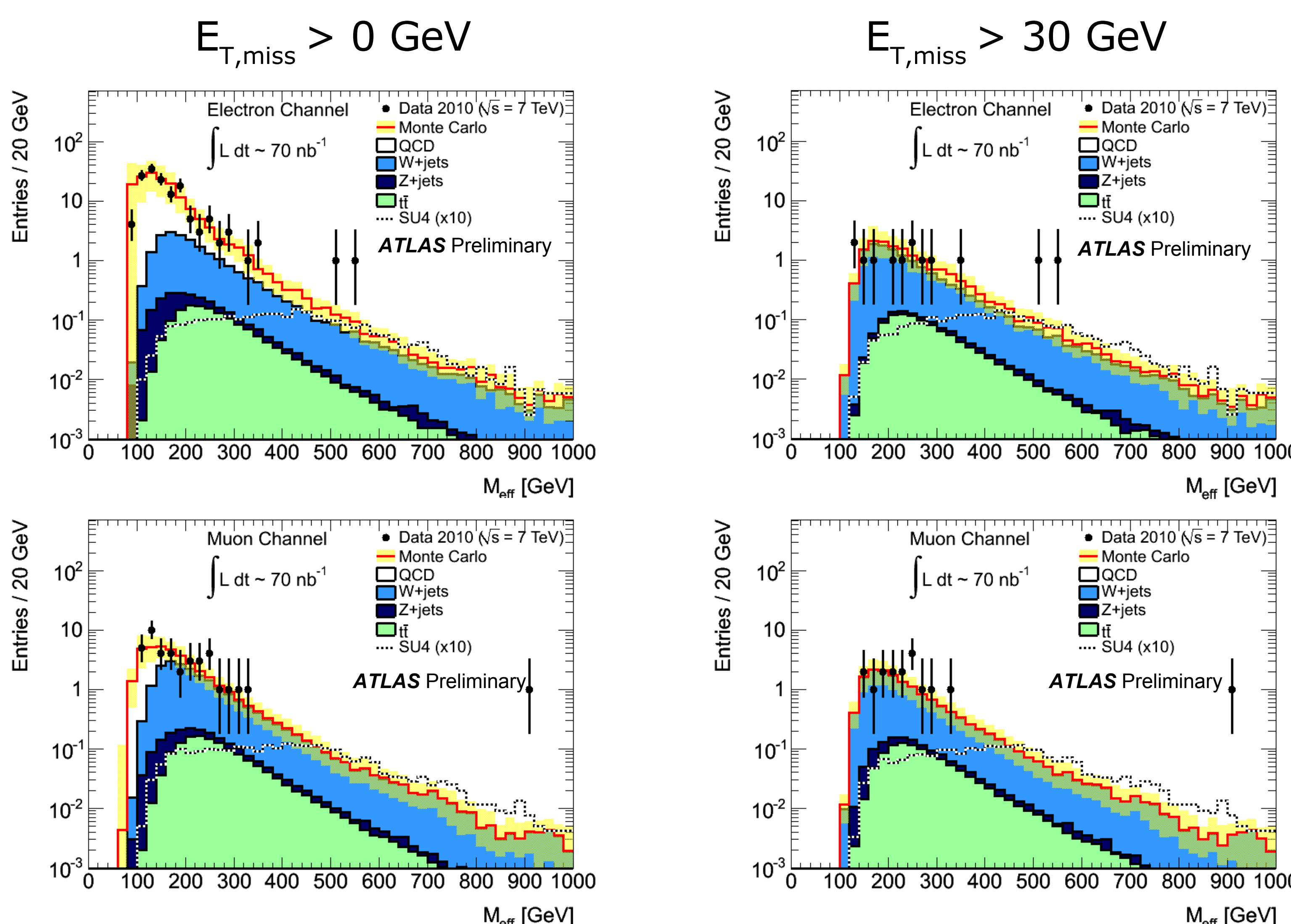


Standard model backgrounds:

Monte Carlo prediction with full detector simulation. QCD and W background scaled to data in low and medium E_T^{miss} and m_T region resp.

QCD: PYTHIA (cross-check with ALPGEN)
W/Z: ALPGEN & HERWIG & JIMMY
tt: MC@NLO & HERWIG & JIMMY
SU4: ISAJET & HERWIG++ & PROSPINO

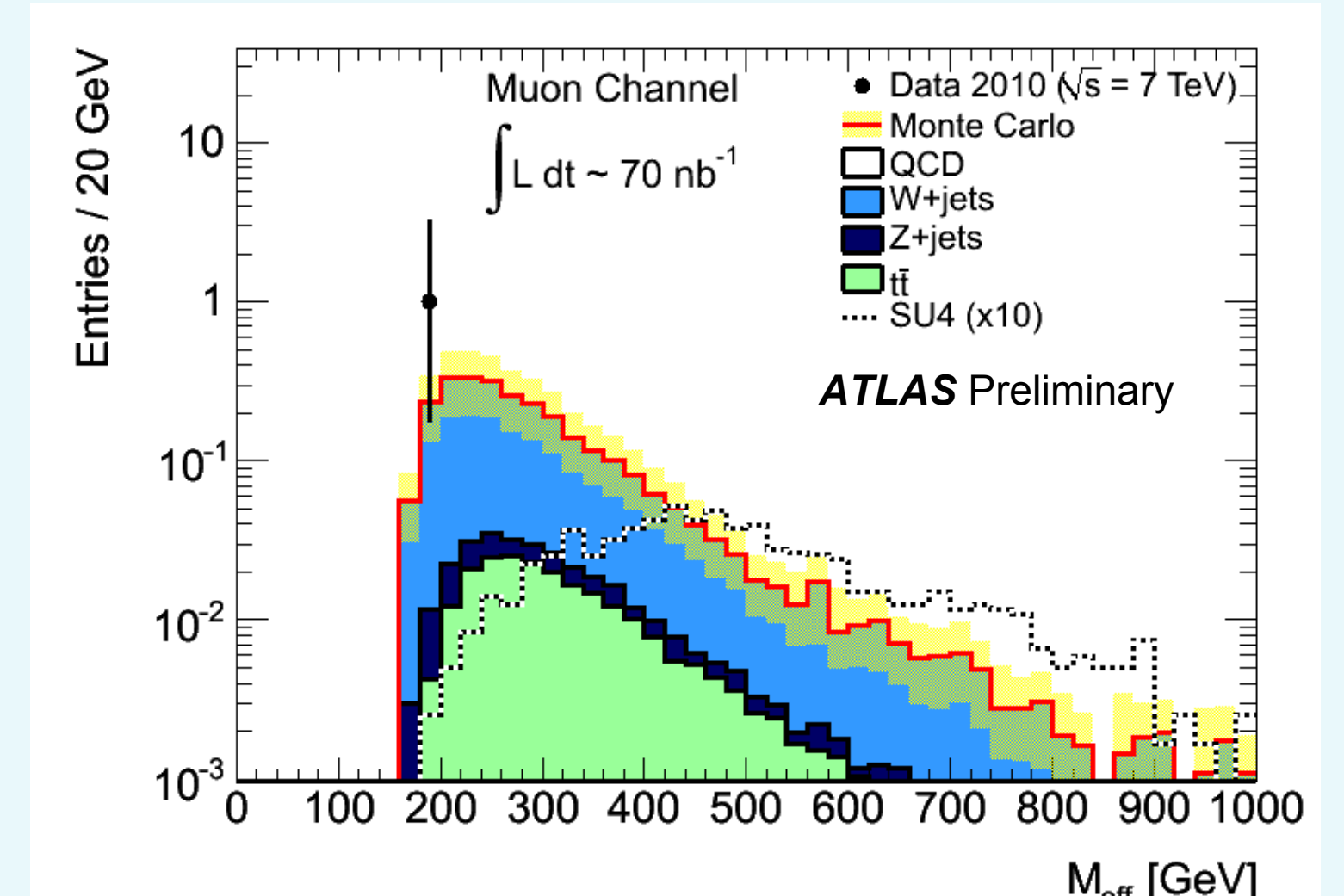
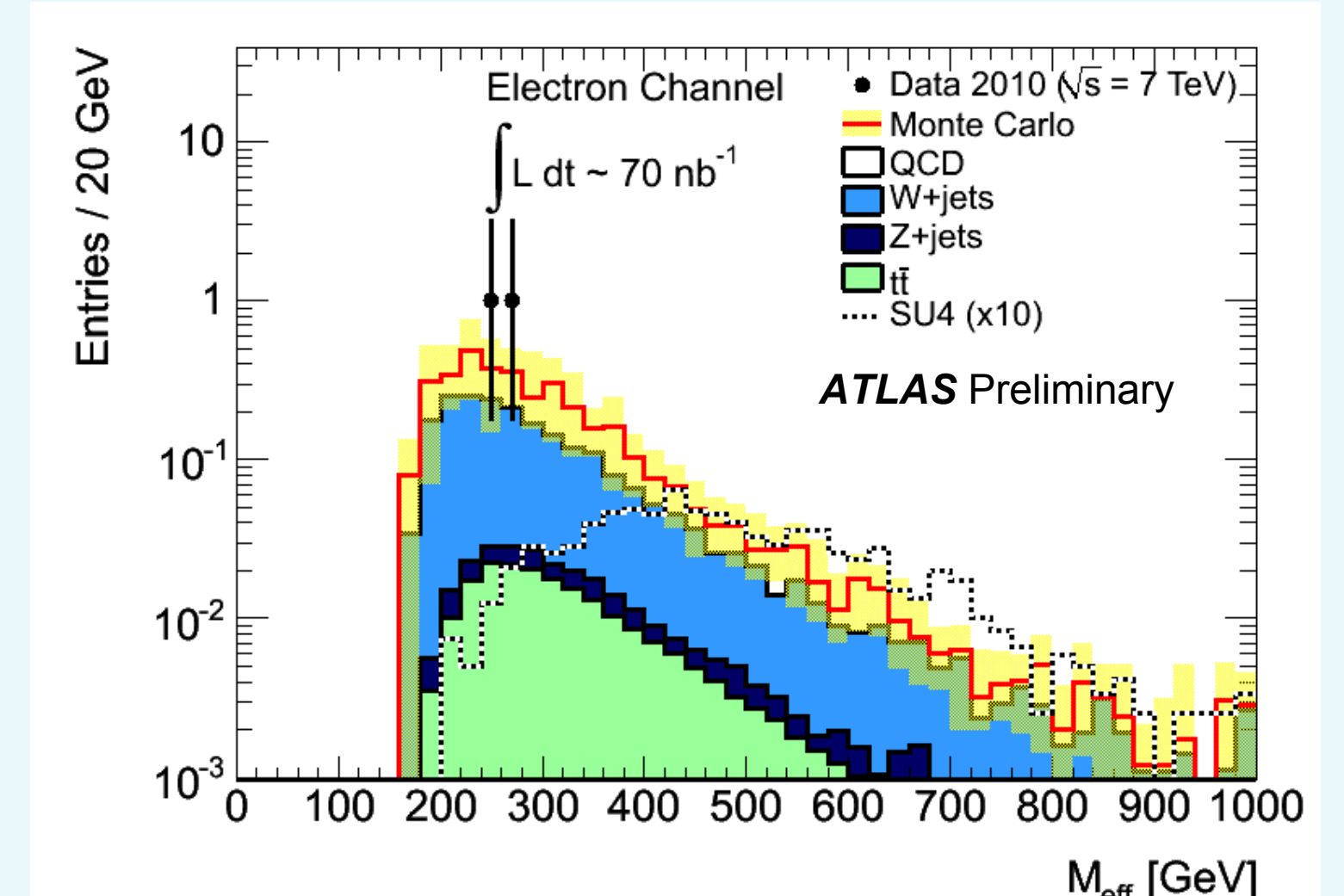
Effective mass distributions:



Good agreement between data and MC prediction

Signal Region:

Transverse mass > 100 GeV to reject leptons from W decays



3 events (consistent with expectation)

2 Lepton Channel:

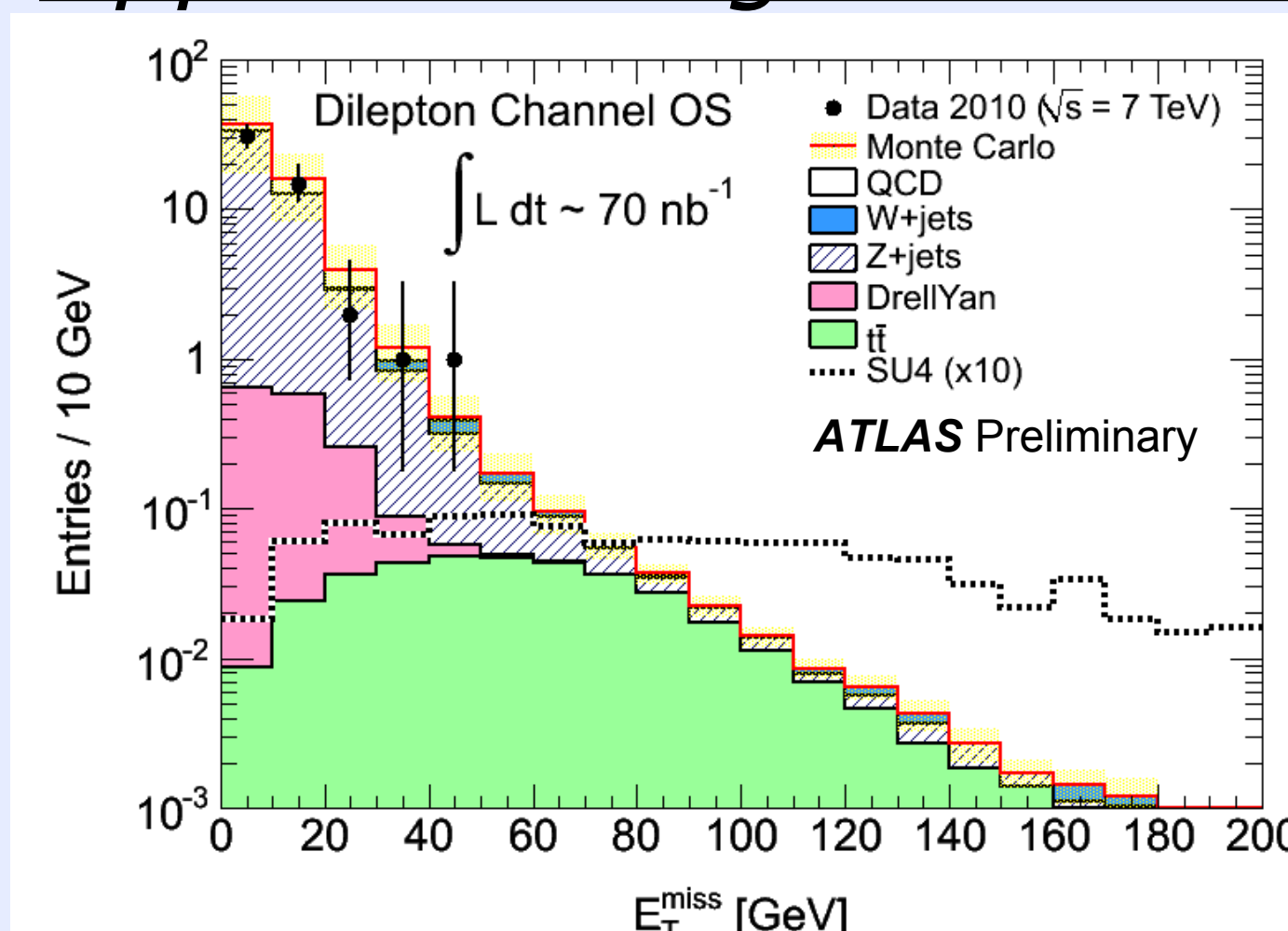
× Select events with two leptons having p_T s > 20 GeV and 10 GeV resp.

× No jet and E_T^{miss} requirement

× Dilepton invariant mass > 5 GeV

× Agreement between data and MC

Opposite charge selection:



Same charge selection:

