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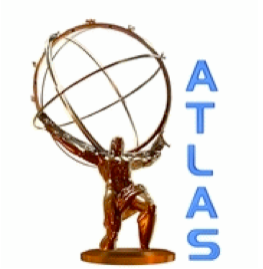


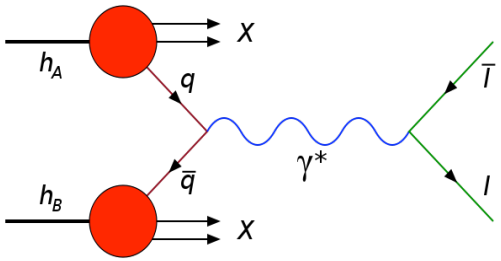
Electron ID Efficiencies for a High Mass Drell-Yan Cross Section Measurement

Katalin Nikolics

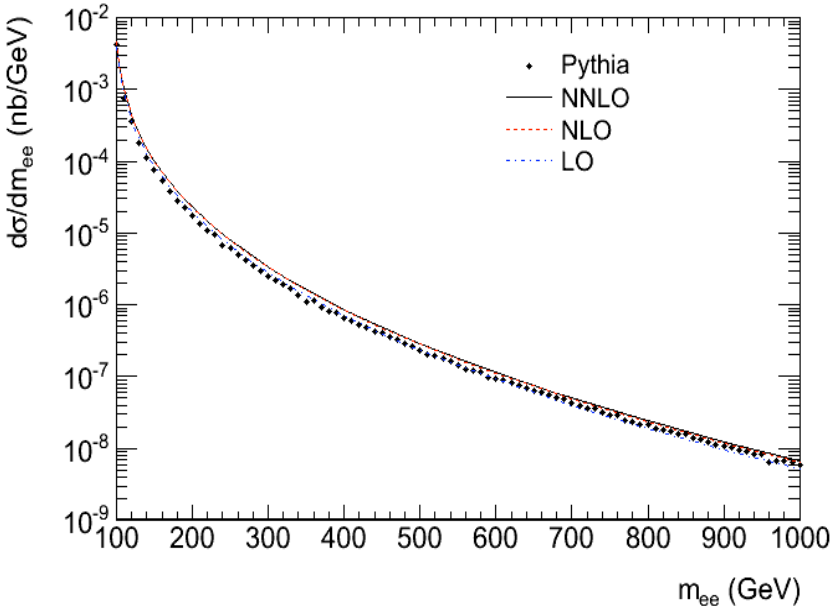
Introduction

- Drell-Yan process:

  quark of hadron A and antiquark of hadron B annihilate, create virtual photon or Z, then decay into oppositely charged leptons



$$\sigma_{measured} = \frac{N_{observed} - N_{background}}{L_{\text{int}} \cdot \varepsilon_{trigger} \cdot \varepsilon_{rec} \cdot \varepsilon_{ID}}$$



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Electron Identification

ID done via cuts on hadronic leakage & calorimeter shower shape variables as well as track, BUT:

How efficiently can we measure electrons when applying these cuts?

Main background sources (for DY):

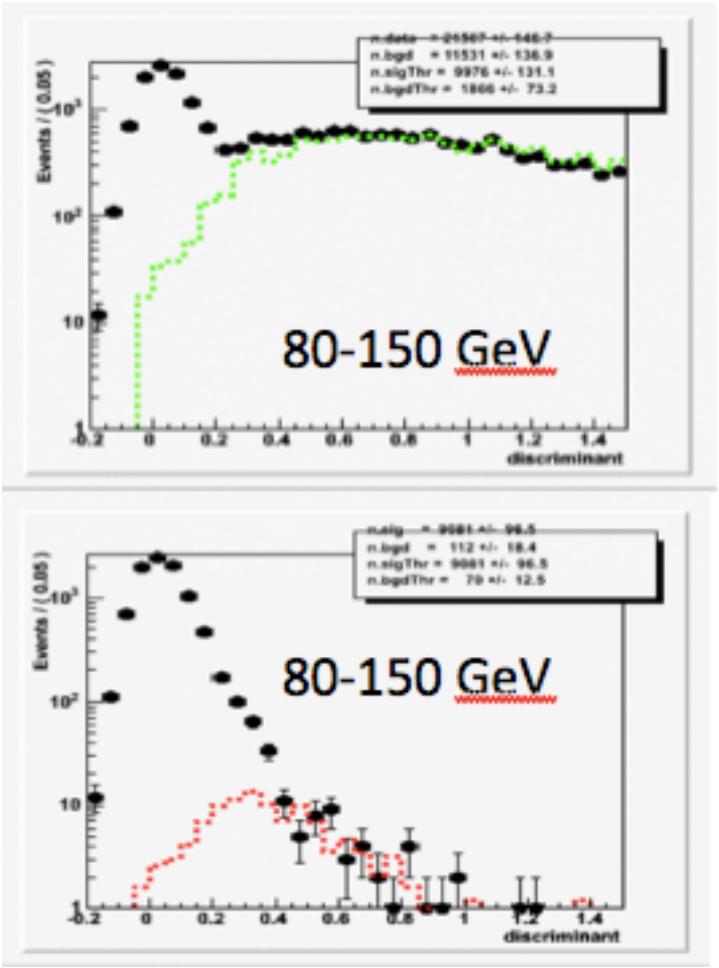
- W + jets
- Di-bosons WW, ZZ, WZ

} real electrons as well as fakes (jets)!

- (ttbar, QCD)

Tag & Probe

- Choose events with two electron candidates passing selection criteria, use well-defined ("tight") electron as tag in the event ➔ remaining electrons are probes
- Choose variable to discriminate signal against fake objects ➔ Calorimeter isolation variable
- Inverting cuts for background template in different bins of E_T



$$\varepsilon = \frac{N_{passID} - N_{ID-Bkg}}{N_{electronCandidates} - N_{Bkg}}$$

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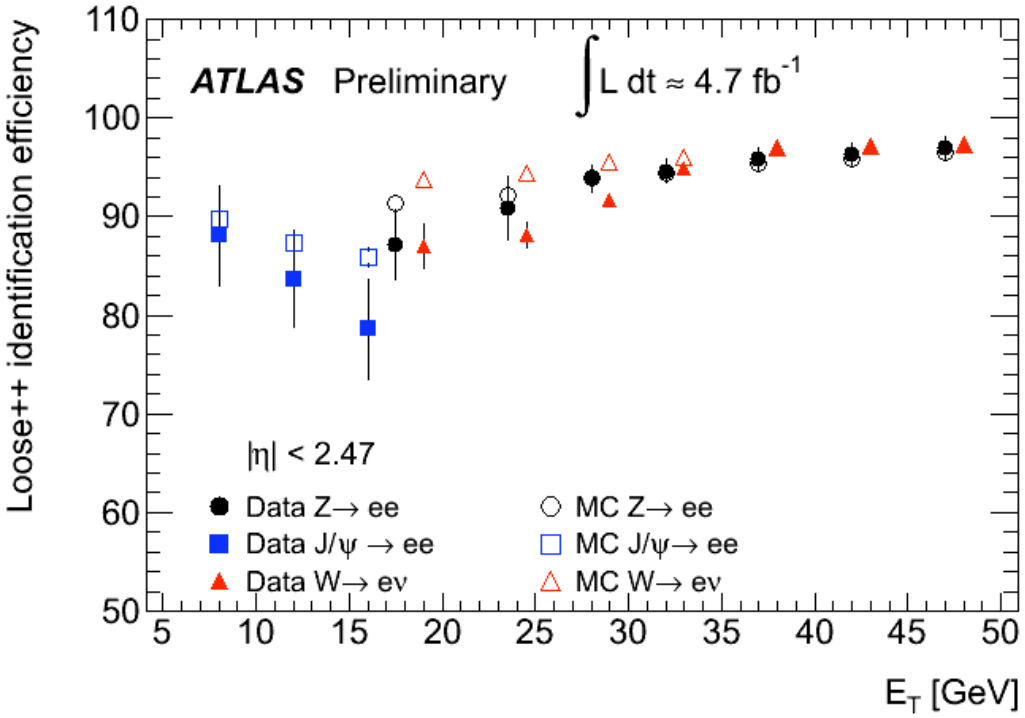
Extracting efficiencies from data



Extend efficiency measurement up to 500 GeV
➔ plots not yet approved, so cannot be showed publicly…

Outlook

Aim to measure efficiency with error ~ 5%

Input these results to the DY cross-section measurement (and other exotic searches using high E_T electrons)