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# Status Update on WW analysis at 1 TeV

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DESY

ILD Software/Analysis Meeting, 14 of November 2012

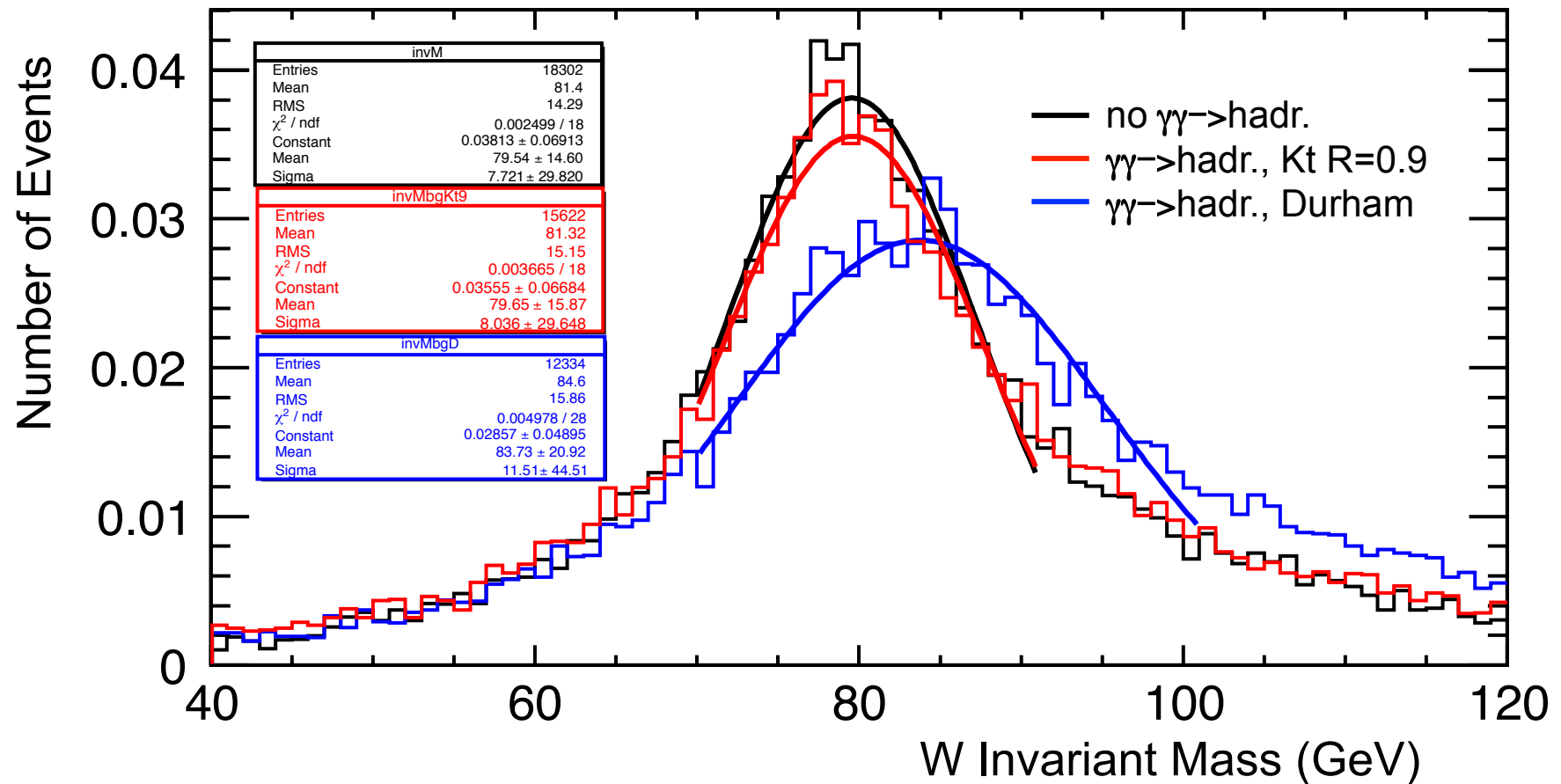
# Introduction

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- Assess the accuracy of the beam polarization measurement using annihilation data, at  $E_{\text{CM}} = 1 \text{ TeV}$ .
- Use the process:  $e^+e^- \rightarrow W^+W^- \rightarrow qq\nu$ ,  $l = e, \mu$ 
  - High cross section, highly dependent on polarization
- Samples used were produced with ilcsoft **v01-15-p00** (no background overlay) and **v01-15-p01** (background overlay).
- Process ID: **200067** (contains the signal and dominant background)

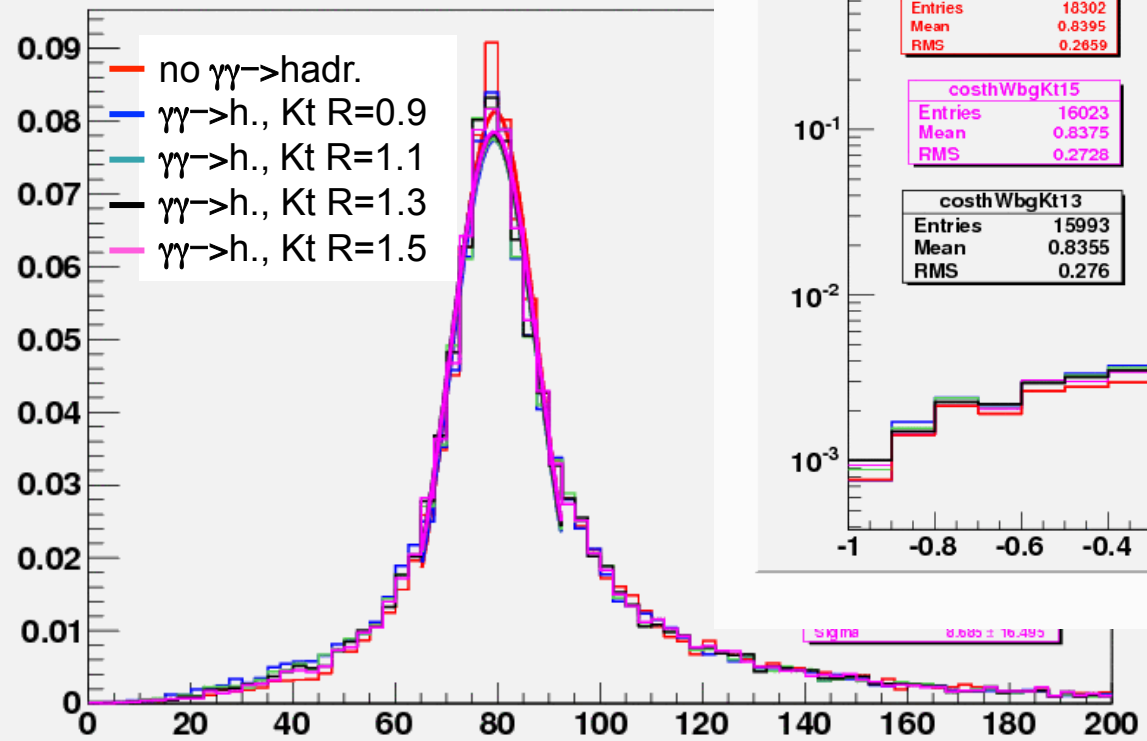
# Recap of the Status in Arlington

- Compare different jet algorithms:  $K_t$  algorithm vs Durham

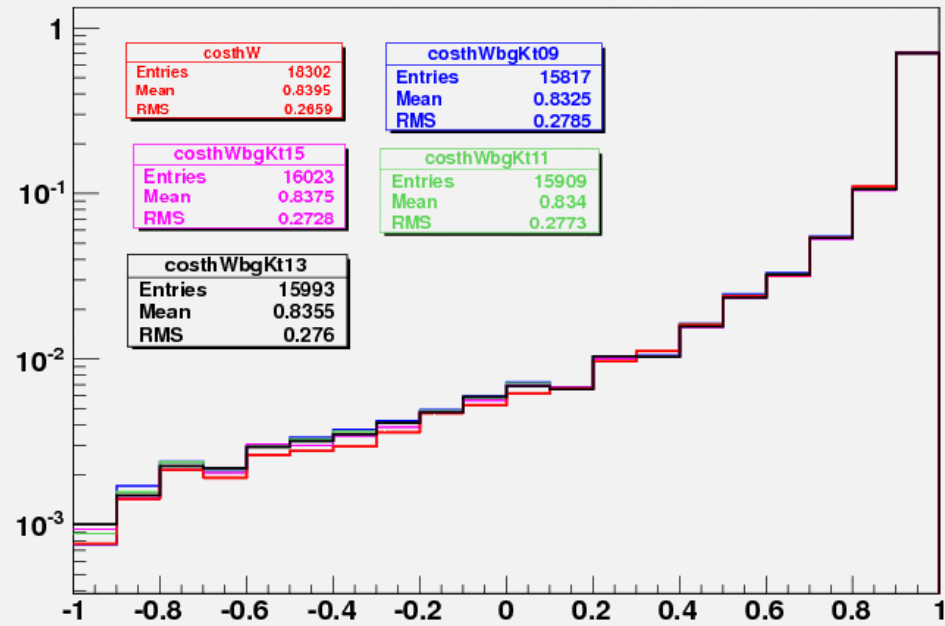


# W Mass and Production Angle

W Invariant Mass

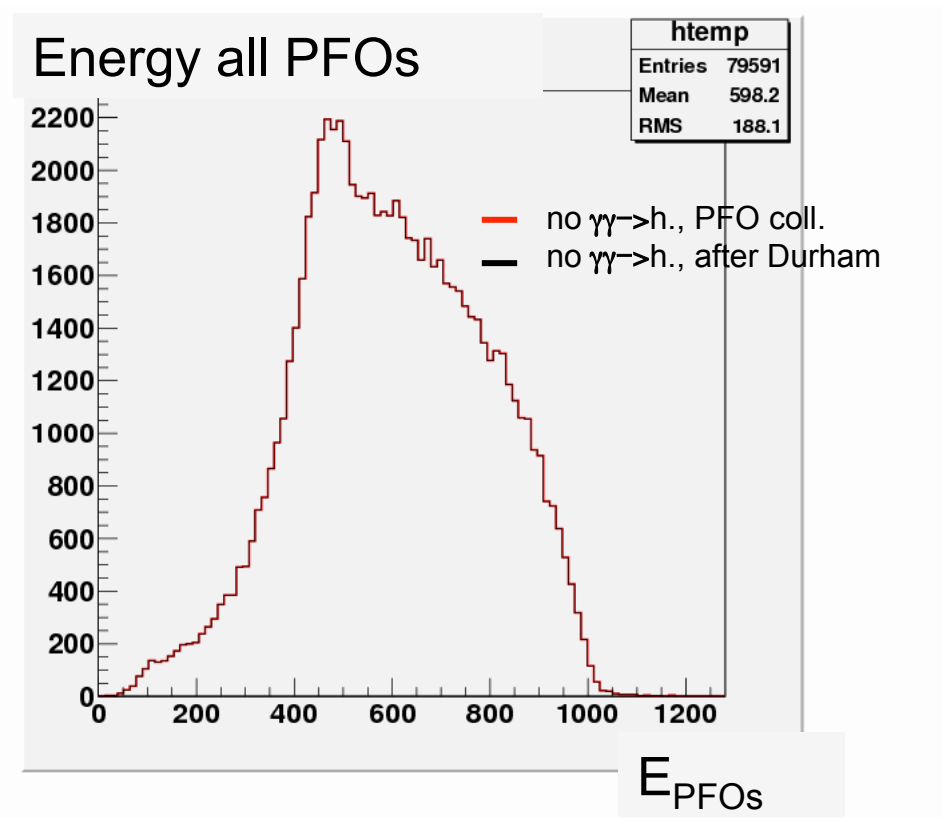
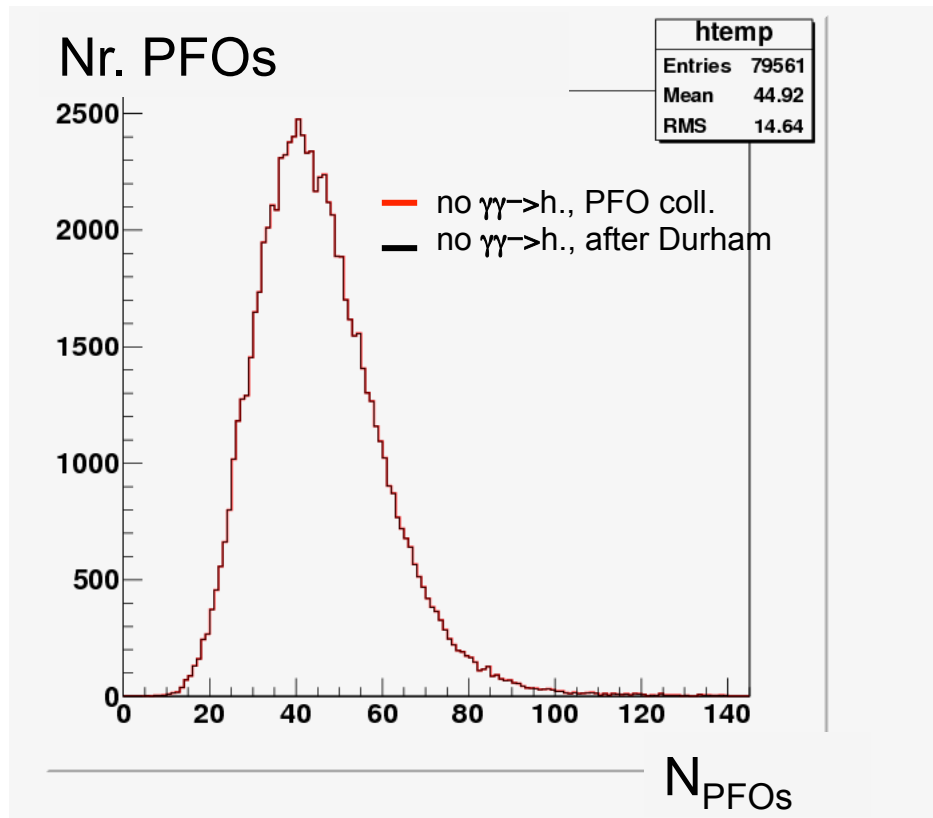


cos theta W



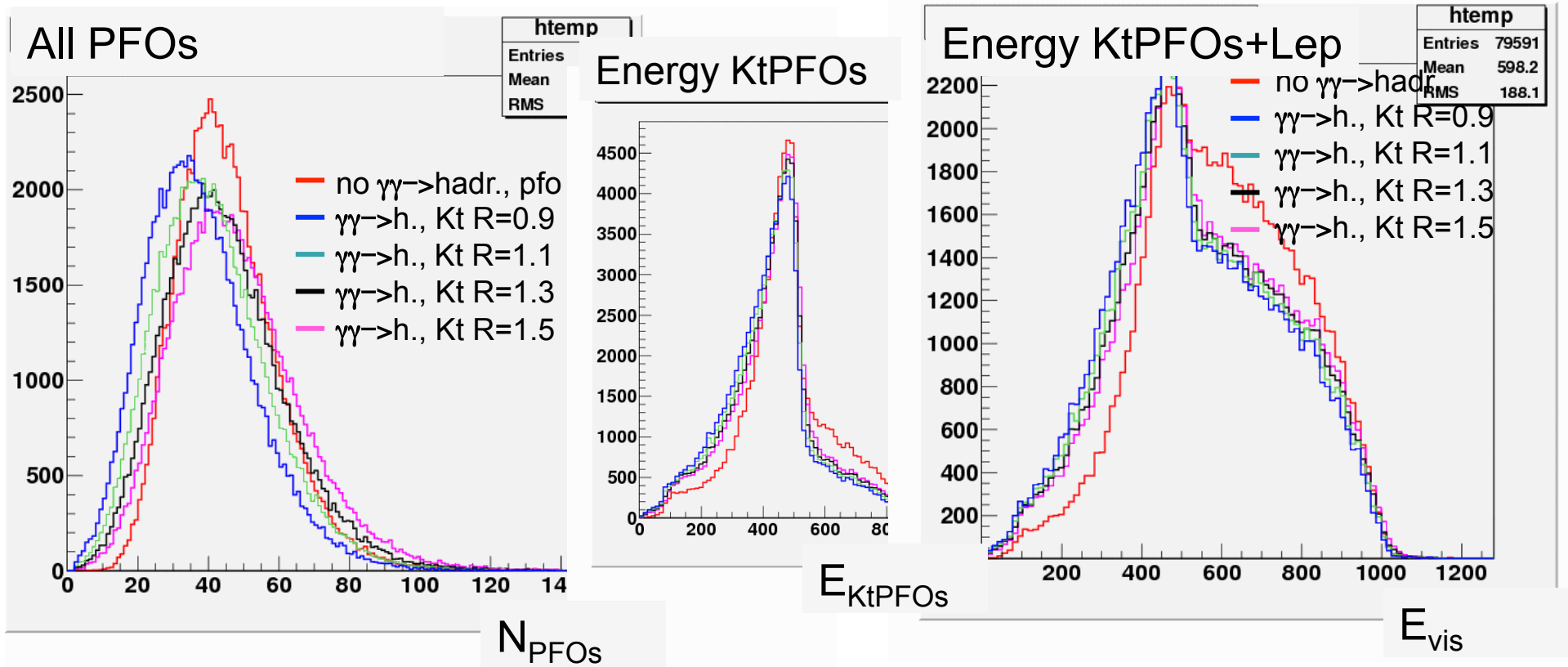
# PFOs after Jet Clustering

Tried the idea of Hiroaki (thank you, Hiroaki!).  
Here no background overlay.



# PFOs after Jet Clustering

With background overlay.



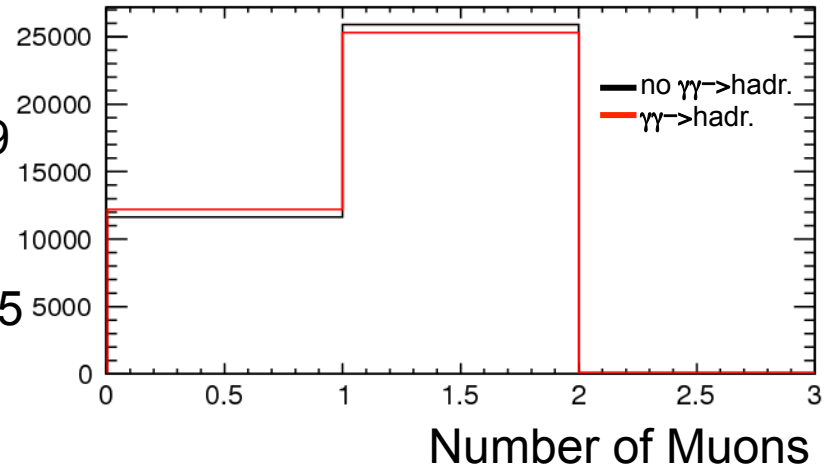
Reasonable choice:  $R = 1.3 - 1.5$

# Lepton Identification

- Lepton ID

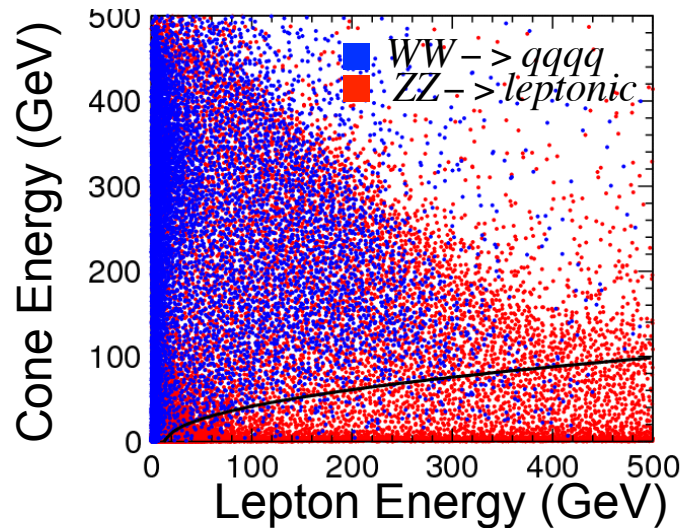
For  $e^+/e^-$  :  $(E_{\text{ECAL}} + E_{\text{HCAL}})/P > 0.8$   
 $E_{\text{ECAL}}/(E_{\text{ECAL}} + E_{\text{HCAL}}) > 0.9$   
 Charge not-zero

For  $\mu^+/\mu^-$  :  $(E_{\text{ECAL}} + E_{\text{HCAL}})/P < 0.4$   
 $E_{\text{ECAL}}/(E_{\text{ECAL}} + E_{\text{HCAL}}) < 0.5$   
 Charge not-zero



- Isolation

$$E_{\text{cone}} < \sqrt{20E_{\ell} - 300}$$



Efficiency: 93%

# Next Steps

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- Within the coming two weeks:
  - Freeze the selection criteria and run the analysis over the entire statistics.
  - Include background processes.
  - Get final numbers for the efficiency and background contamination.
  - Extract polarization using the Blondel method.



# Current Status

