



# Update on $Z \rightarrow e^+e^-$ analysis

**Kalanand Mishra**

*on behalf of **Z Signal Extraction** team*

*VBTF meeting  
(January 7, 2011)*

# “WP80, $E_T > 20$ GeV” vs “WP85, $E_T > 25$ GeV”



/DYToEE\_M-20\_CT10\_TuneZ2\_7TeV-powheg-pythia/Fall10-START38\_V12-v1/GEN-SIM-RECO

#Generated events = 1998990

#Reconstructed events:

WP80,  $E_T > 20$  GeV

WP85,  $E_T > 25$  GeV

MC

Z yield Total = 324366  
Z yield EBEB = 185165  
Z yield EBEE = 109772  
Z yield EEEE = 29429

Z yield Total = 322475  
Z yield EBEB = 185736  
Z yield EBEE = 105839  
Z yield EEEE = 30900

0.6% loss

Data,  
36  $\text{pb}^{-1}$

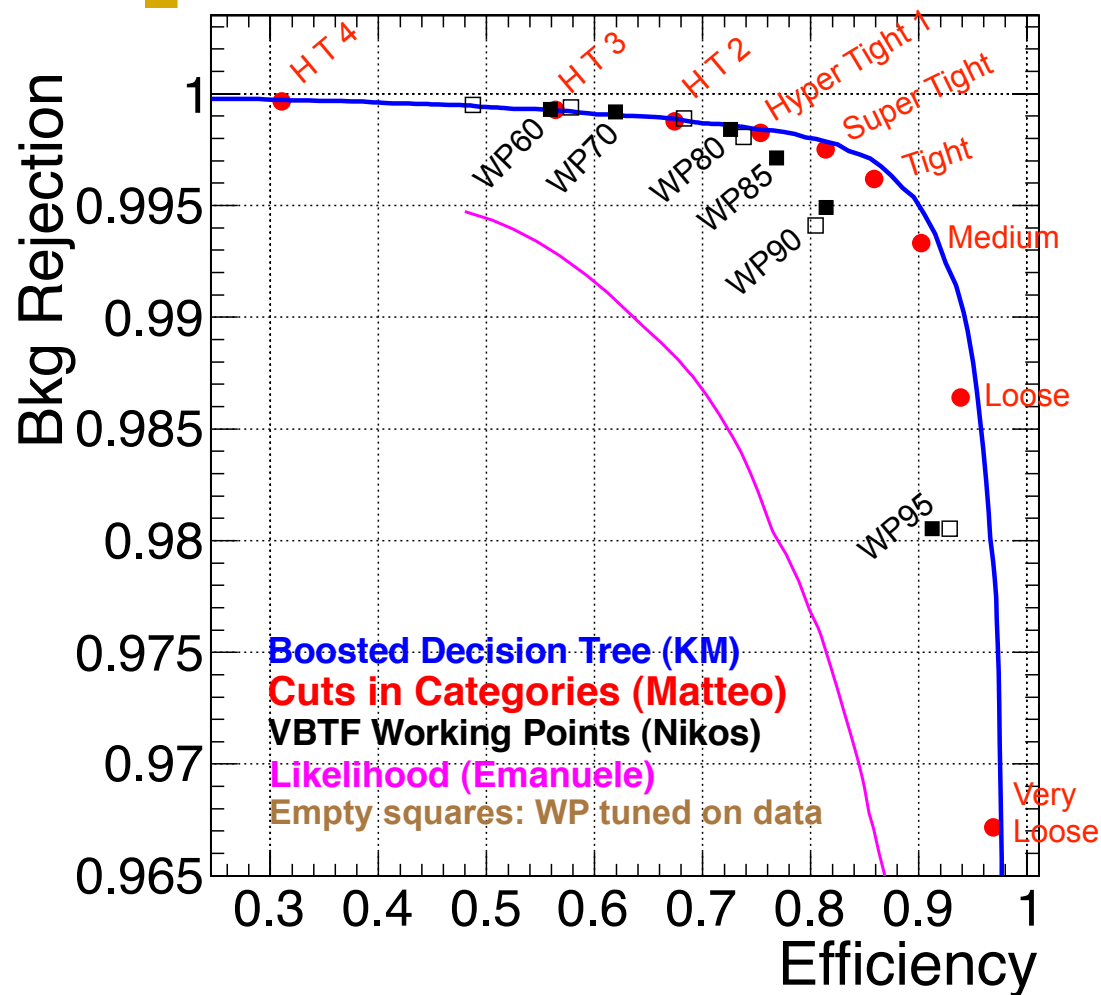
Z yield Total = 8255  
Z yield EBEB = 4773  
Z yield EBEE = 2682  
Z yield EEEE = 800

Z yield Total = 8353  
Z yield EBEB = 4870  
Z yield EBEE = 2658  
Z yield EEEE = 825

1.2% gain

Conclusion: “WP85,  $E_T > 25$  GeV” is a fair deal for  $Z \rightarrow ee$  analysis.  
Additionally, we can use looser “Ele22” trigger for last chunk of data.

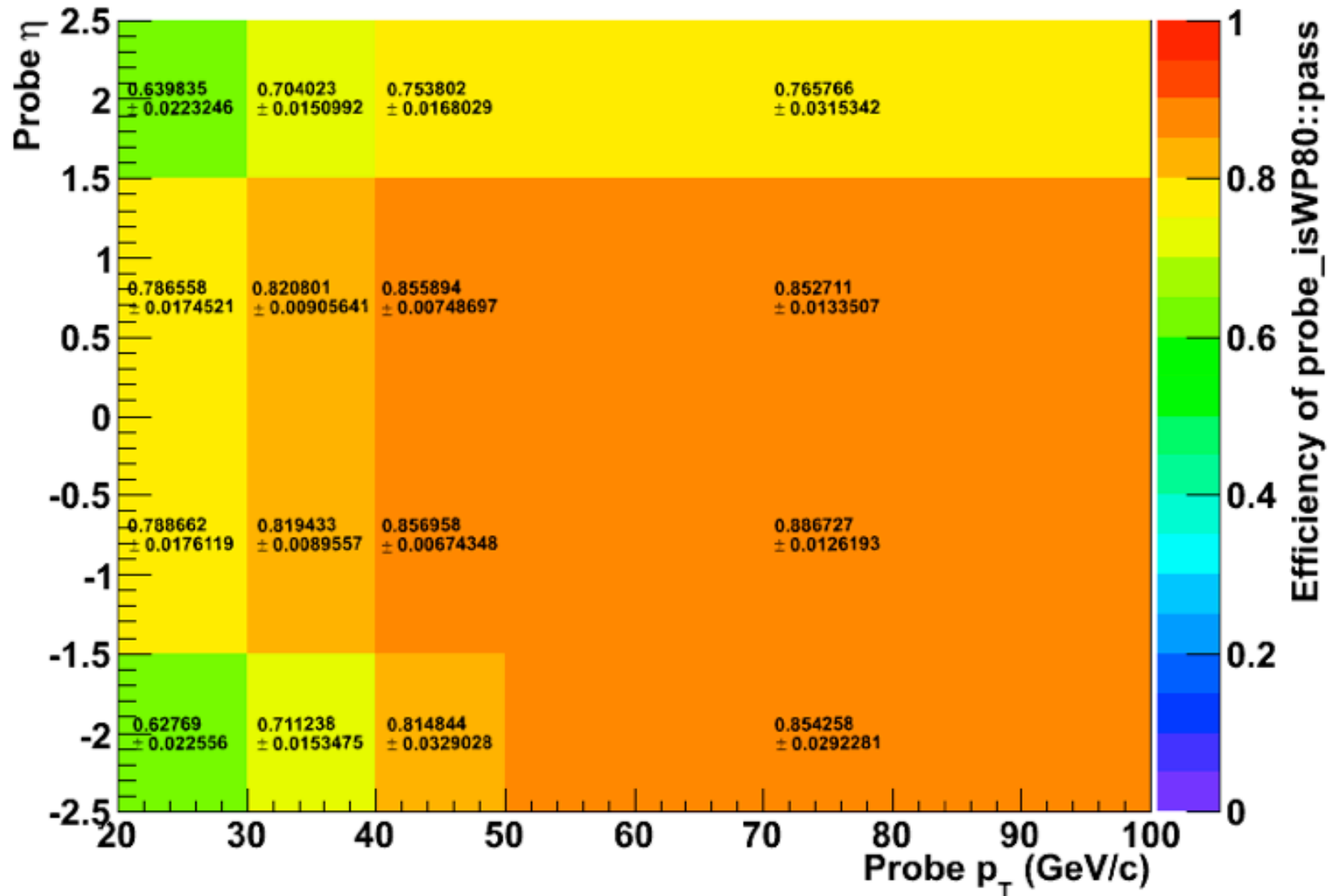
# Some updates on electron selection



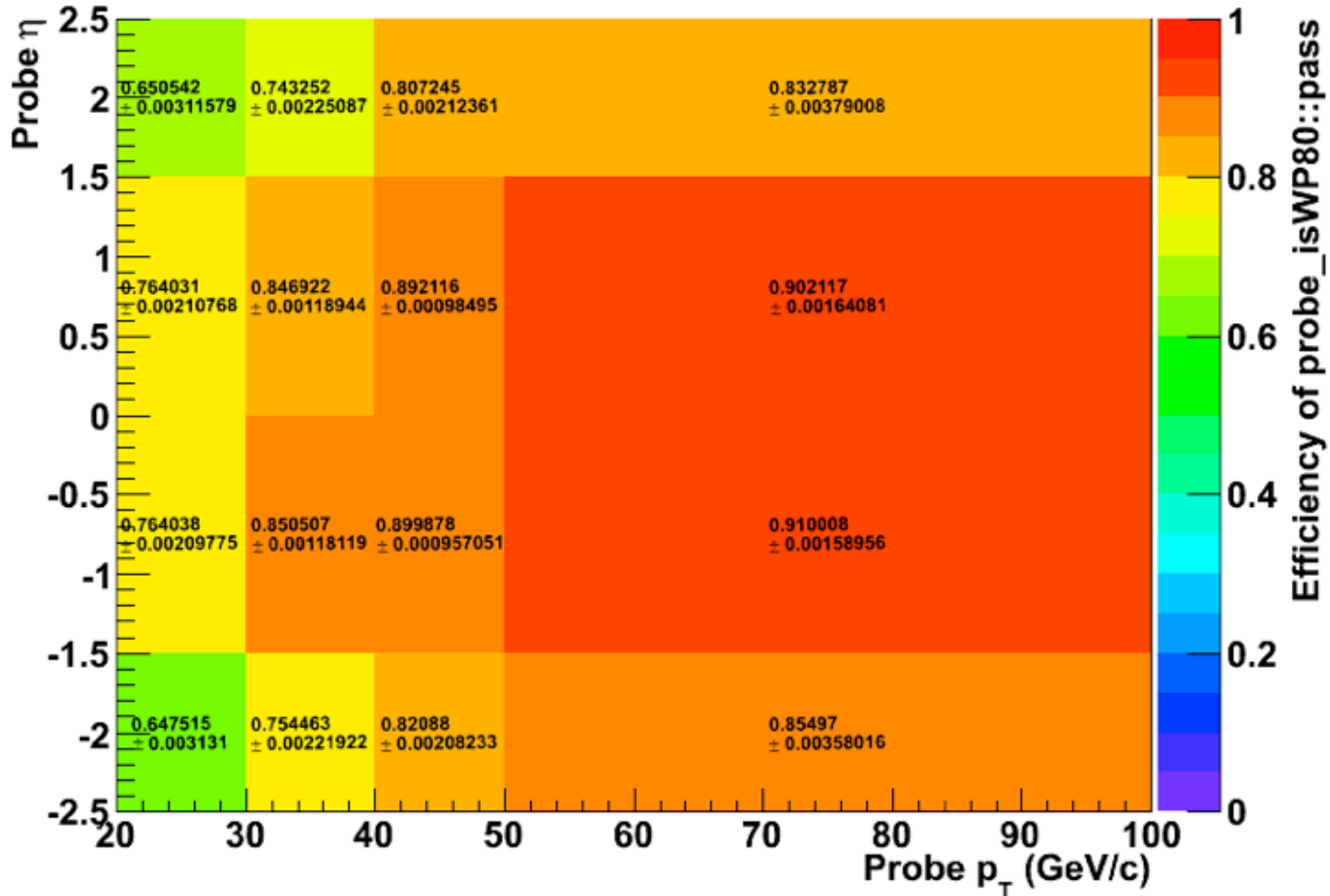
Next slides have efficiency for some of these selections

- The higher the curve/point, the better performing it is
- All selections have been treated at equal footing.
  - efficiency computed exact same way in all cases
  - Apply selections as advertised by developers
- Need to look at missing  $E_T$  plot for  $W \rightarrow e\nu$  candidates and evaluate performance of each selection.
  - Bkg composition is somewhat different (more heavy flavor ...) in this sample.

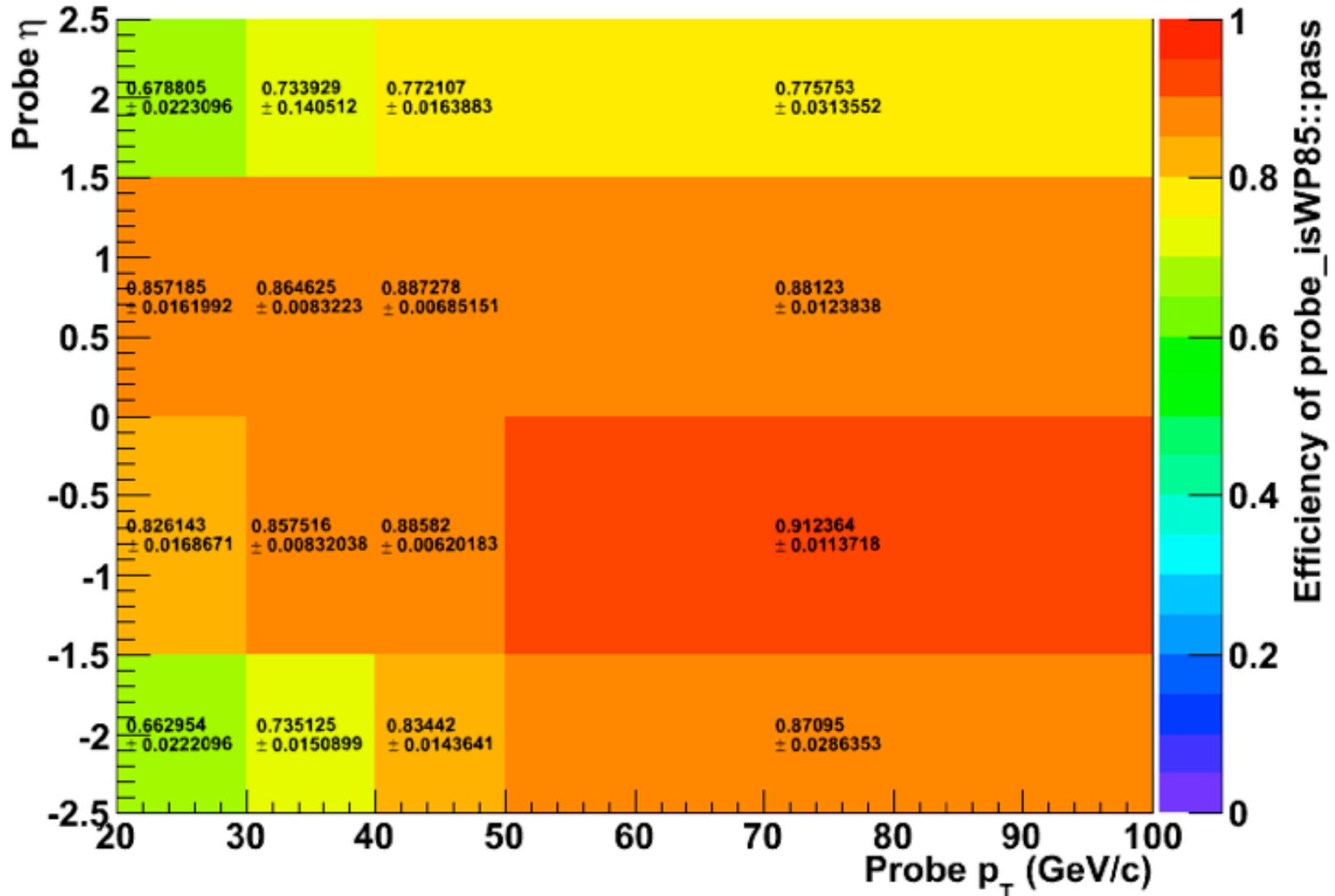
# Efficiency (very preliminary): WP80 data



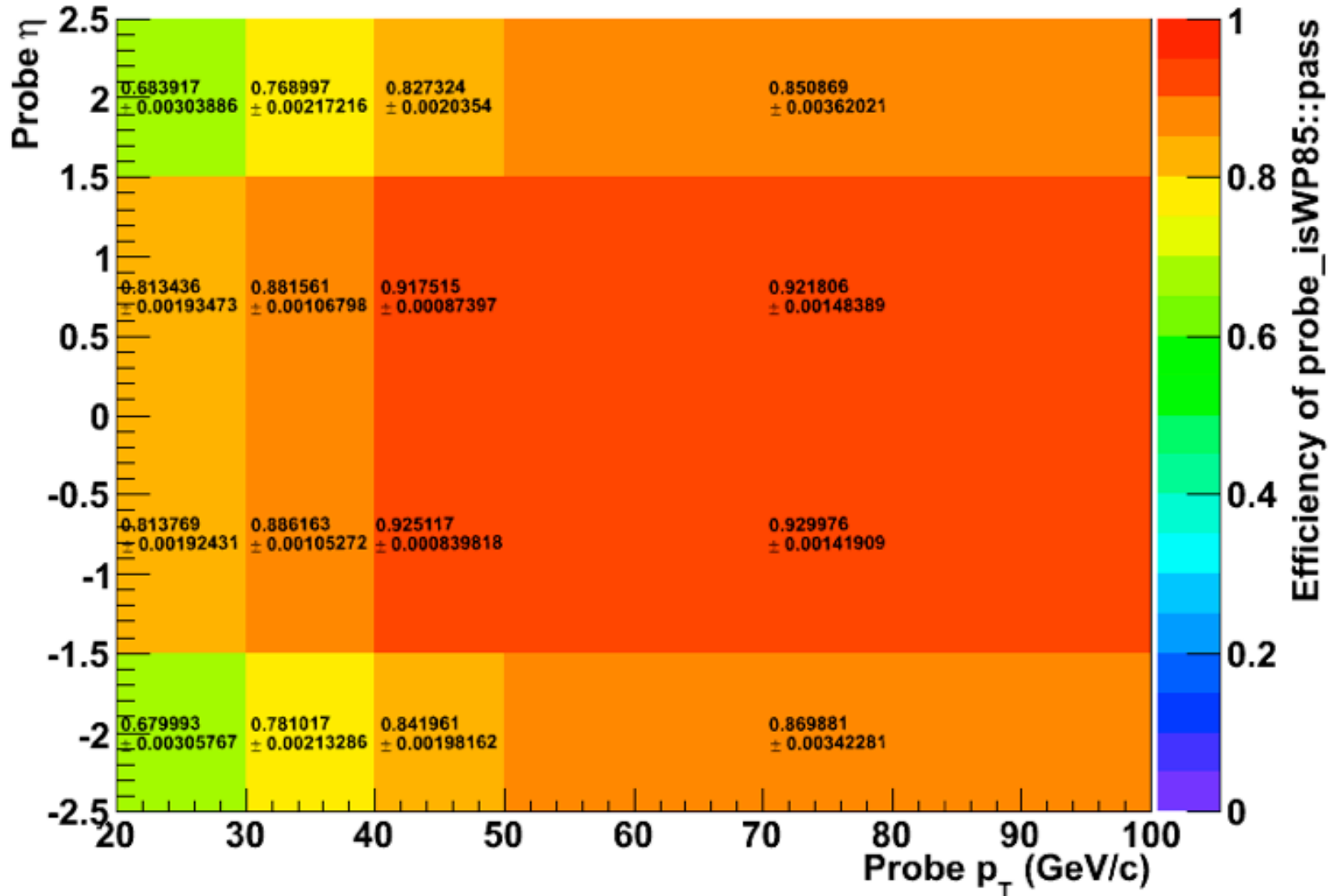
# Efficiency (very preliminary): WP80 MC



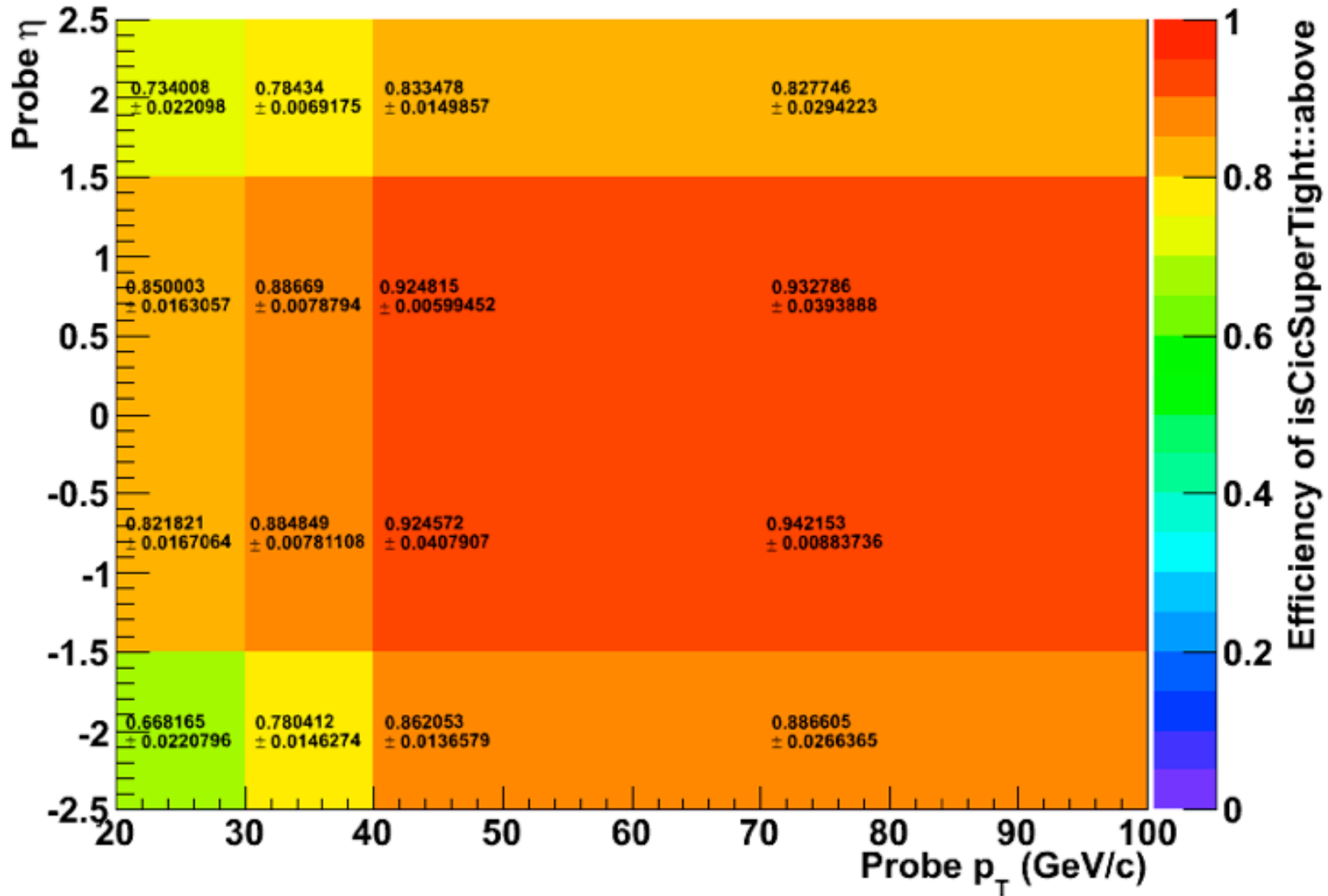
# Efficiency (very preliminary): WP85 data



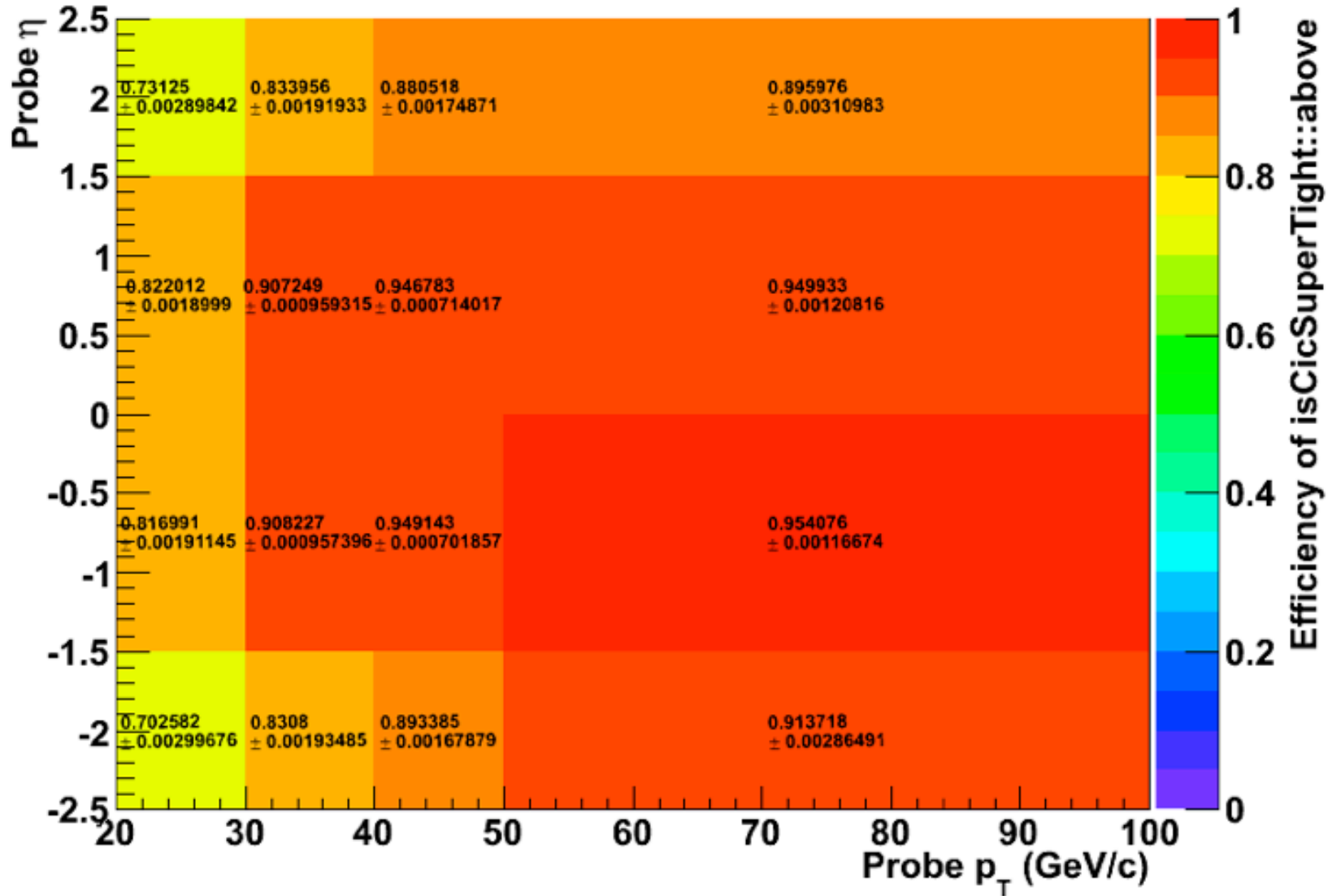
# Efficiency (very preliminary): WP85 MC



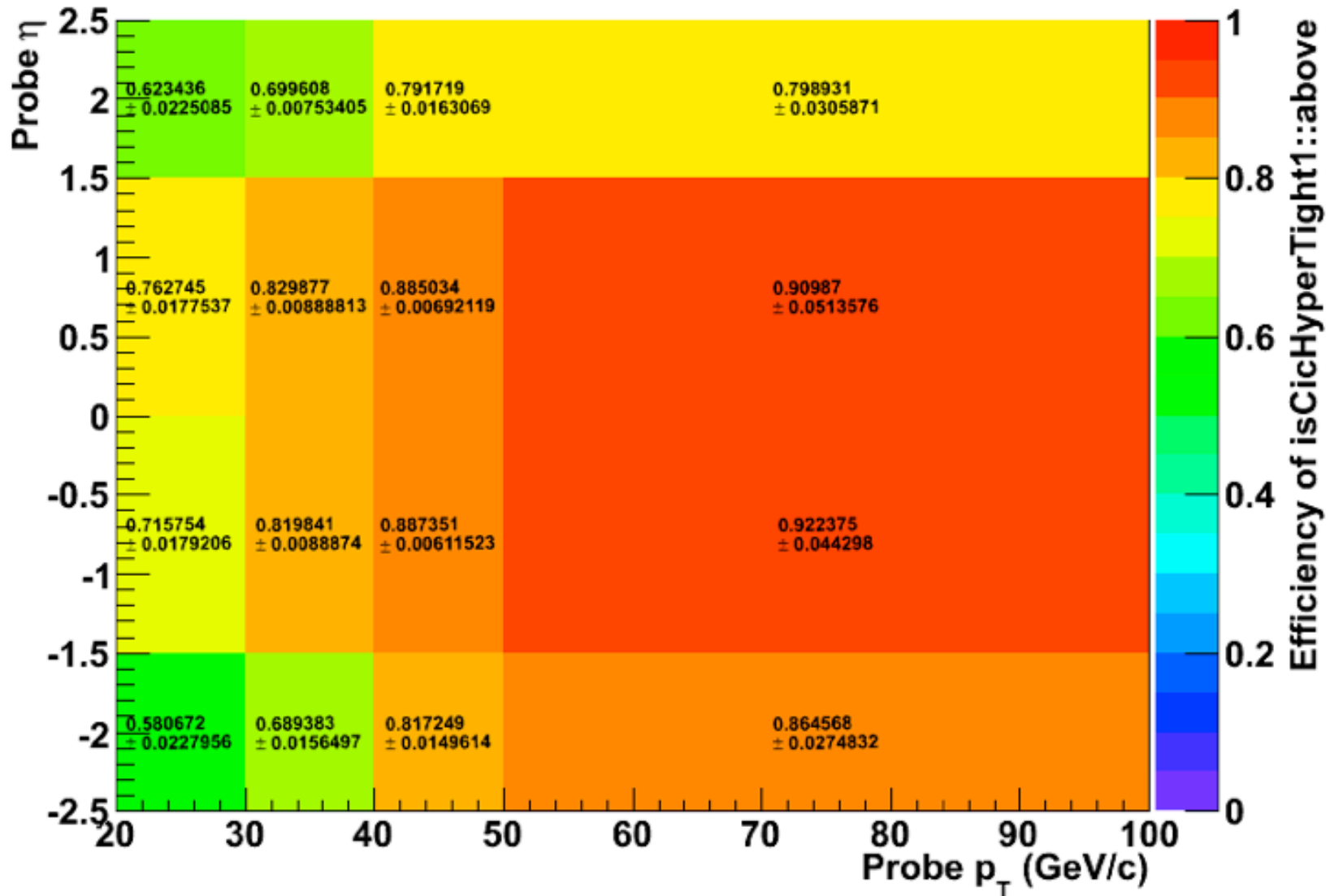
# Efficiency (very prelim): SuperTight data



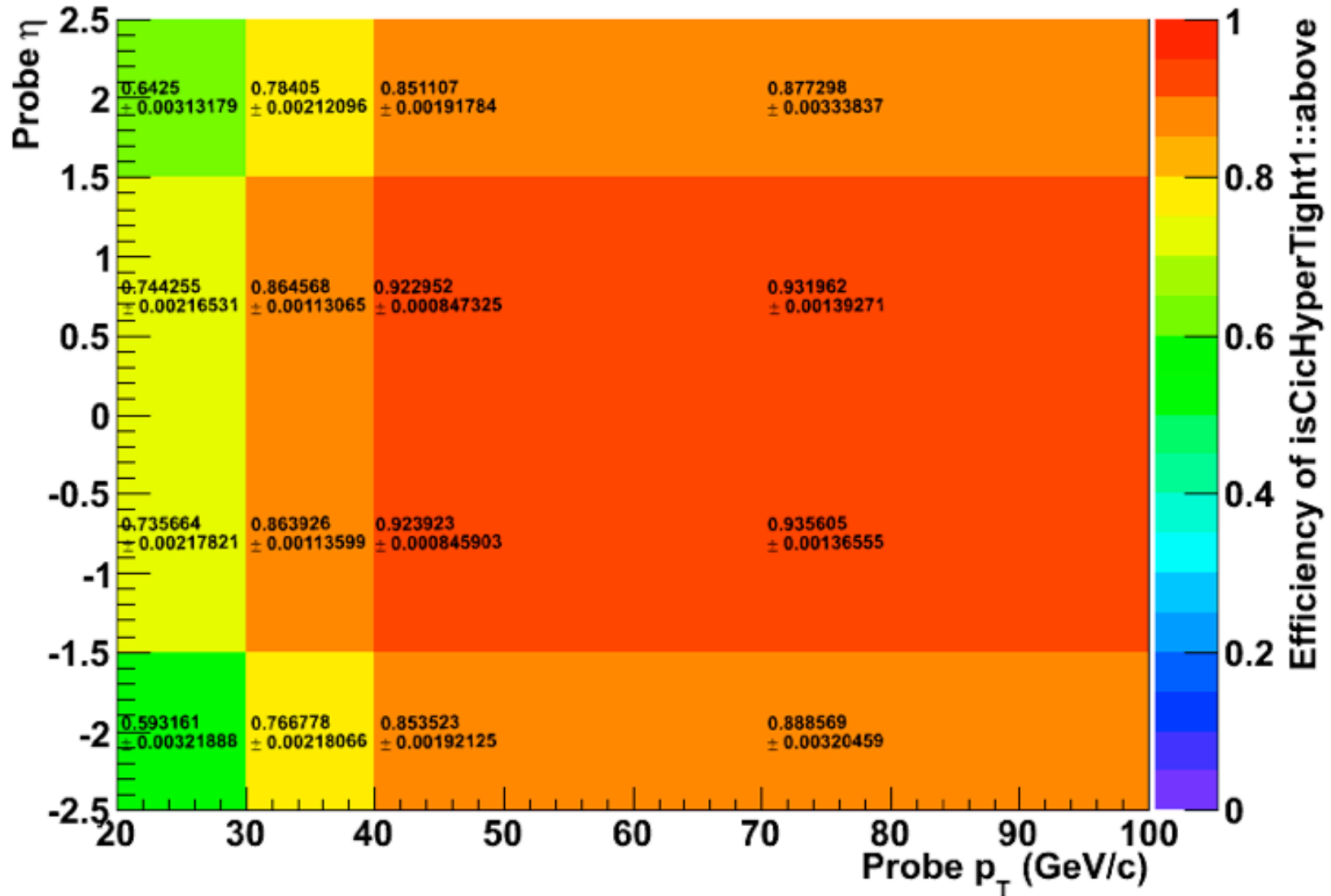
# Efficiency (very prelim): SuperTight MC



# Efficiency (very prelim): HyperTight-1 data



# Efficiency (very prelim): HyperTight-1 MC



## Efficiency etc.



Very preliminary efficiencies of all other selections and HLT can be found here

<http://home.fnal.gov/~kalanand/work/EWK/VBTF/Efficiency/>

We are in the process of

- updating to proper  $E_T$ ,  $\eta$  binning
- cross checking the results
- computing systematic uncertainties

Once we finalize all these details we will present the results in Egamma and will update the existing analysis note (AN-2010/349).