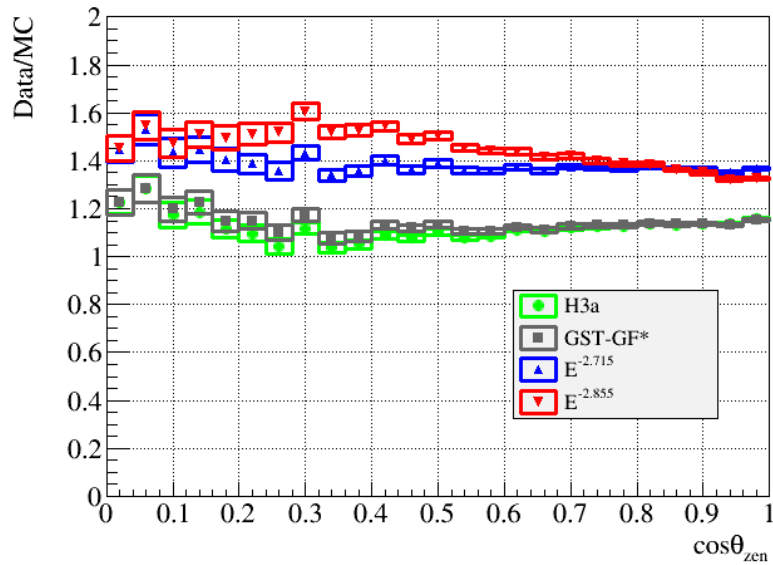


# DOM Angular Sensitivity Effect on Reconstructed Zenith Angle

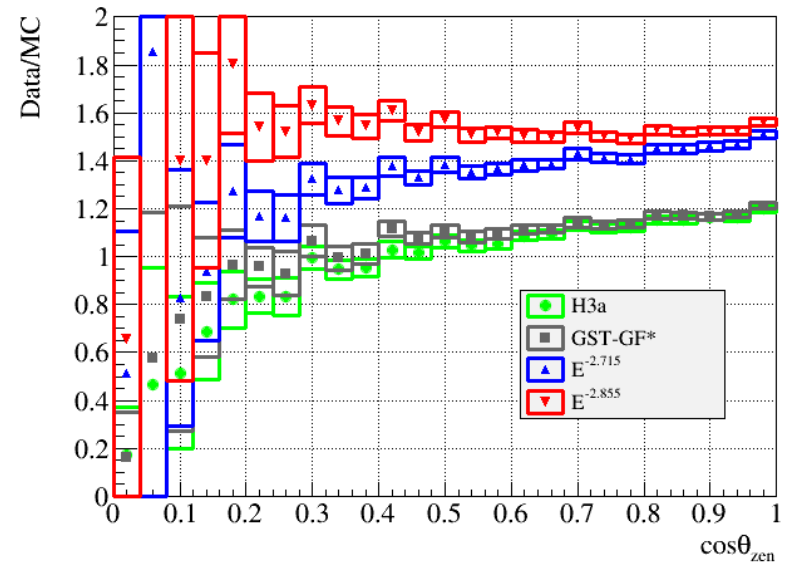
Hans-Peter Bretz  
Muon Workshop  
Madison, May 3, 2015

# Problem

## Zenith distribution at Trigger Level



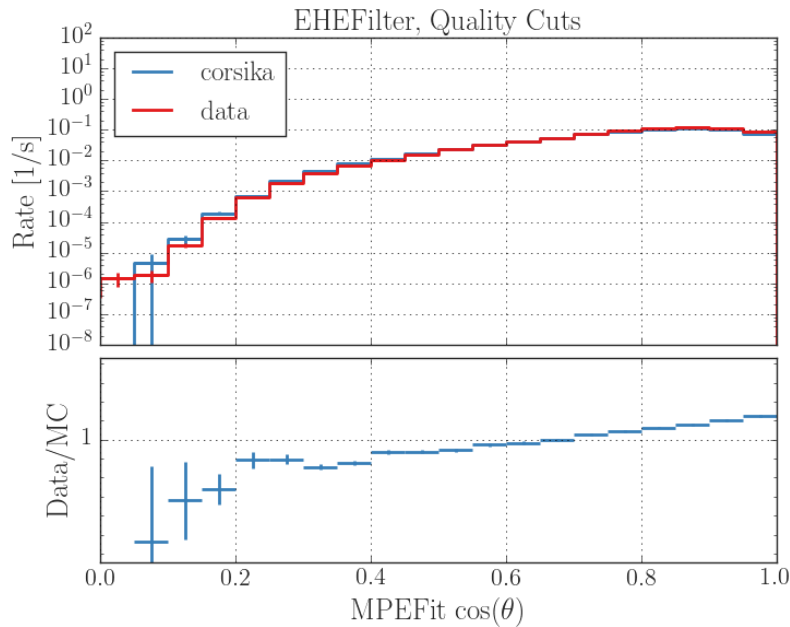
## Zenith distribution HQ tracks



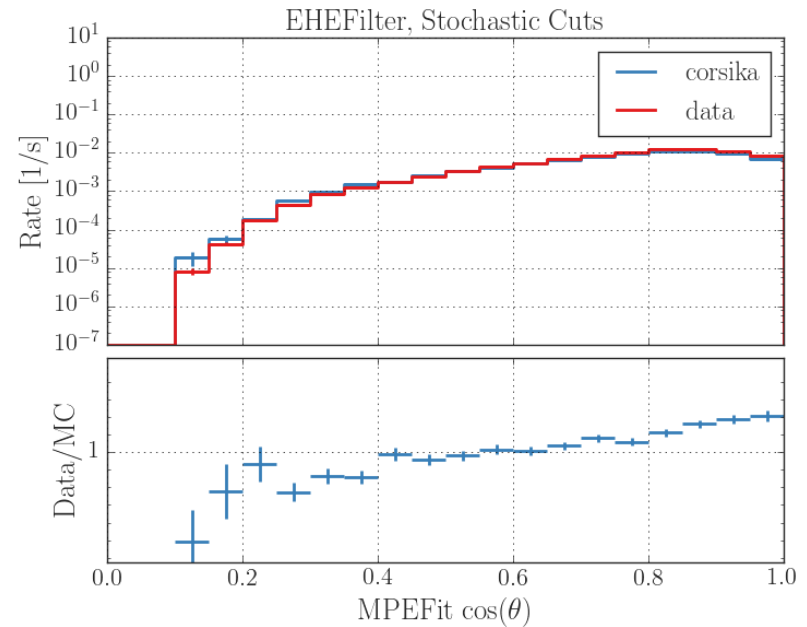
- Direct track length > 600m
- $llh\_reco / (N\_DOM - 2.5) < 7.5$



# IC86-I Burnsample with 9622&10309 CORSIKA



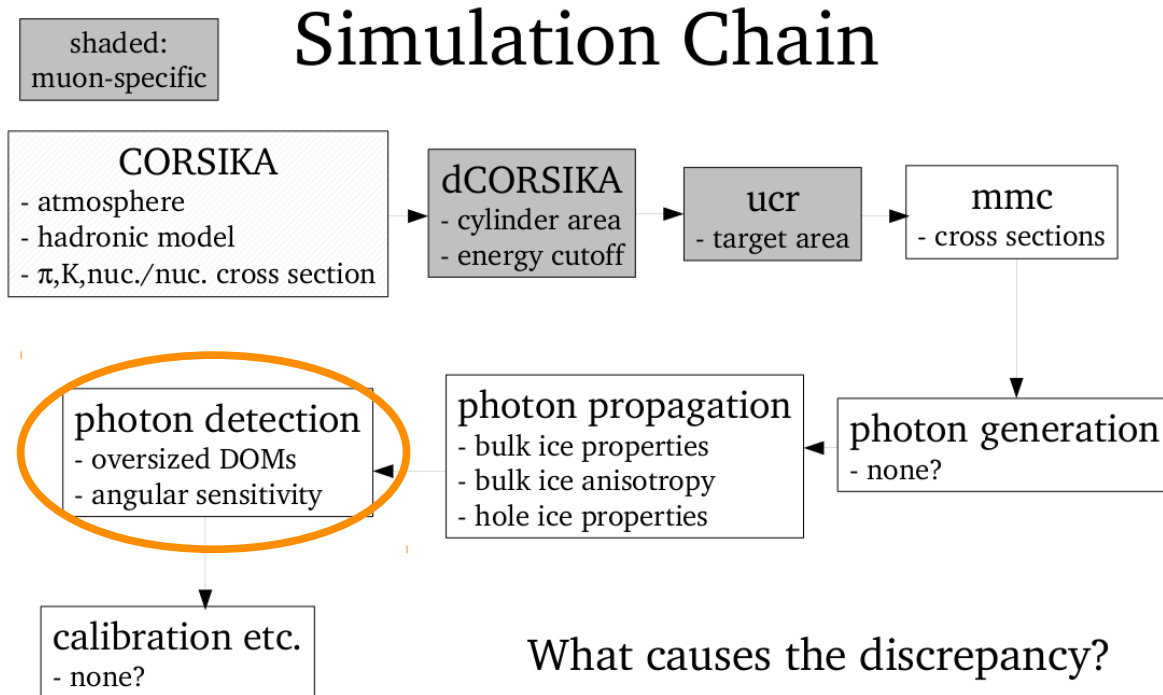
Weighting: H3a



Muons with high stochastic losses

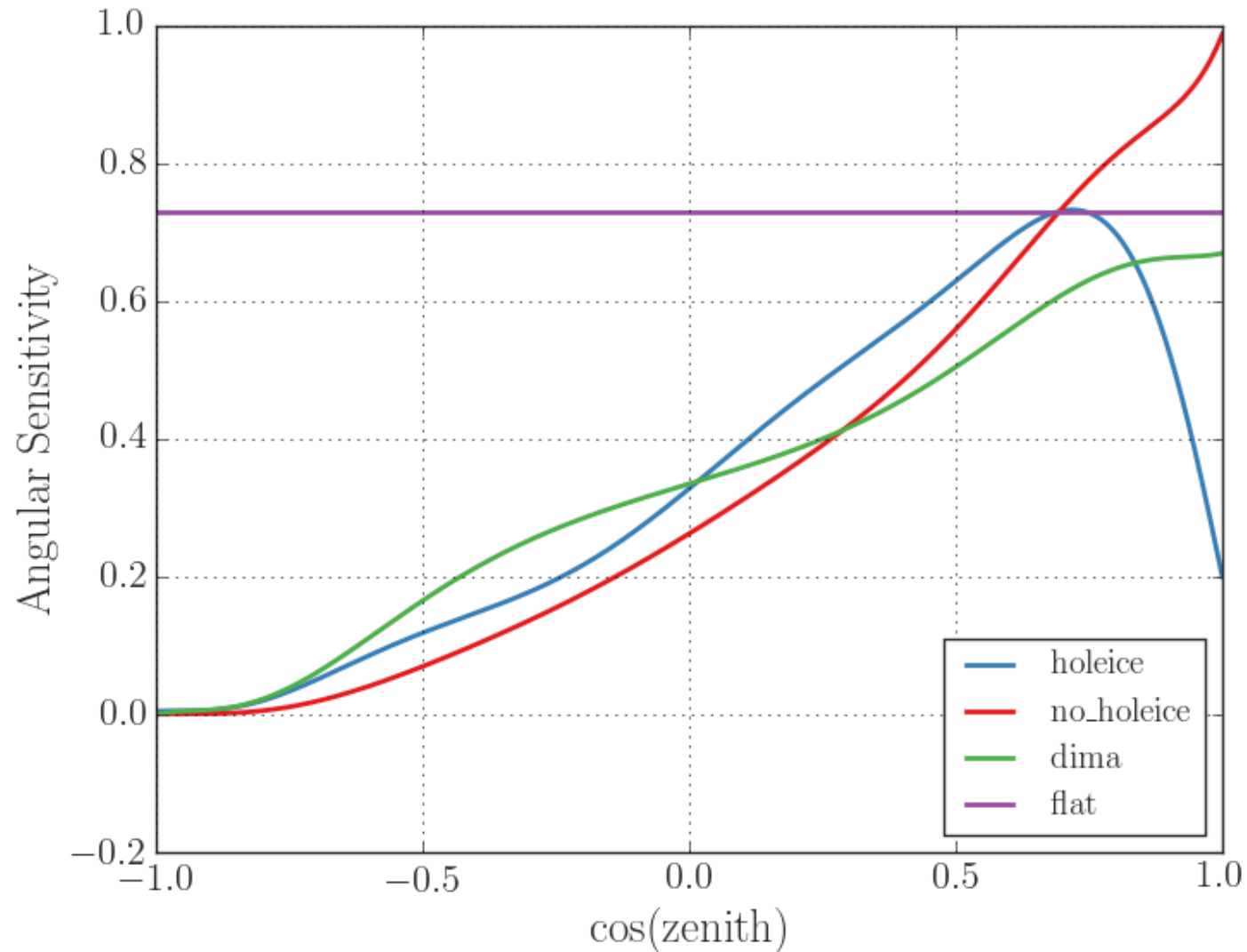


# Possible error sources in Simulation Chain



What causes the discrepancy?

# Try different angular response

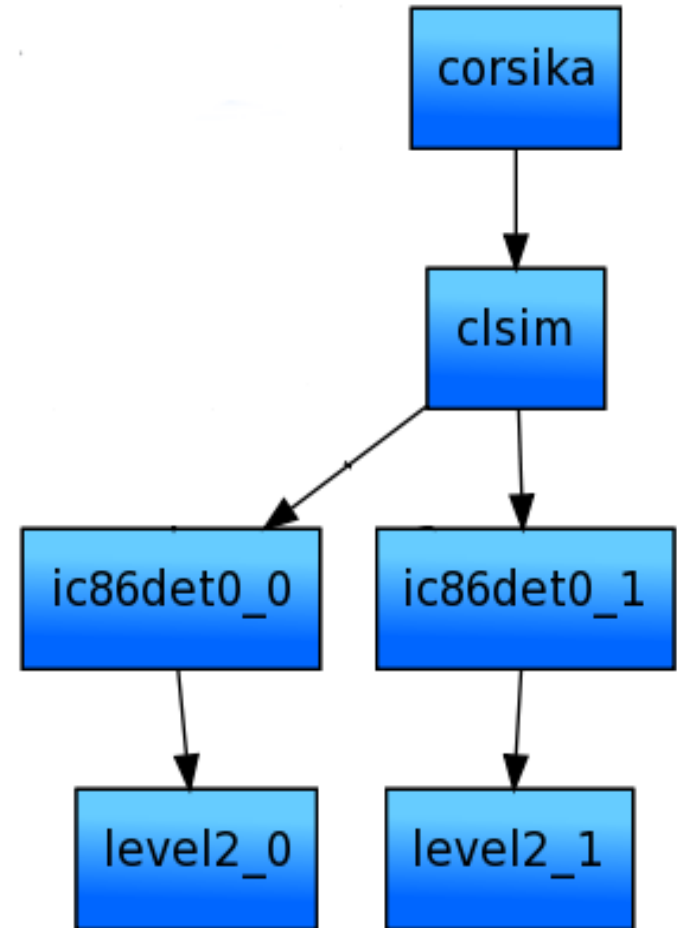


# Dcorsika simulation

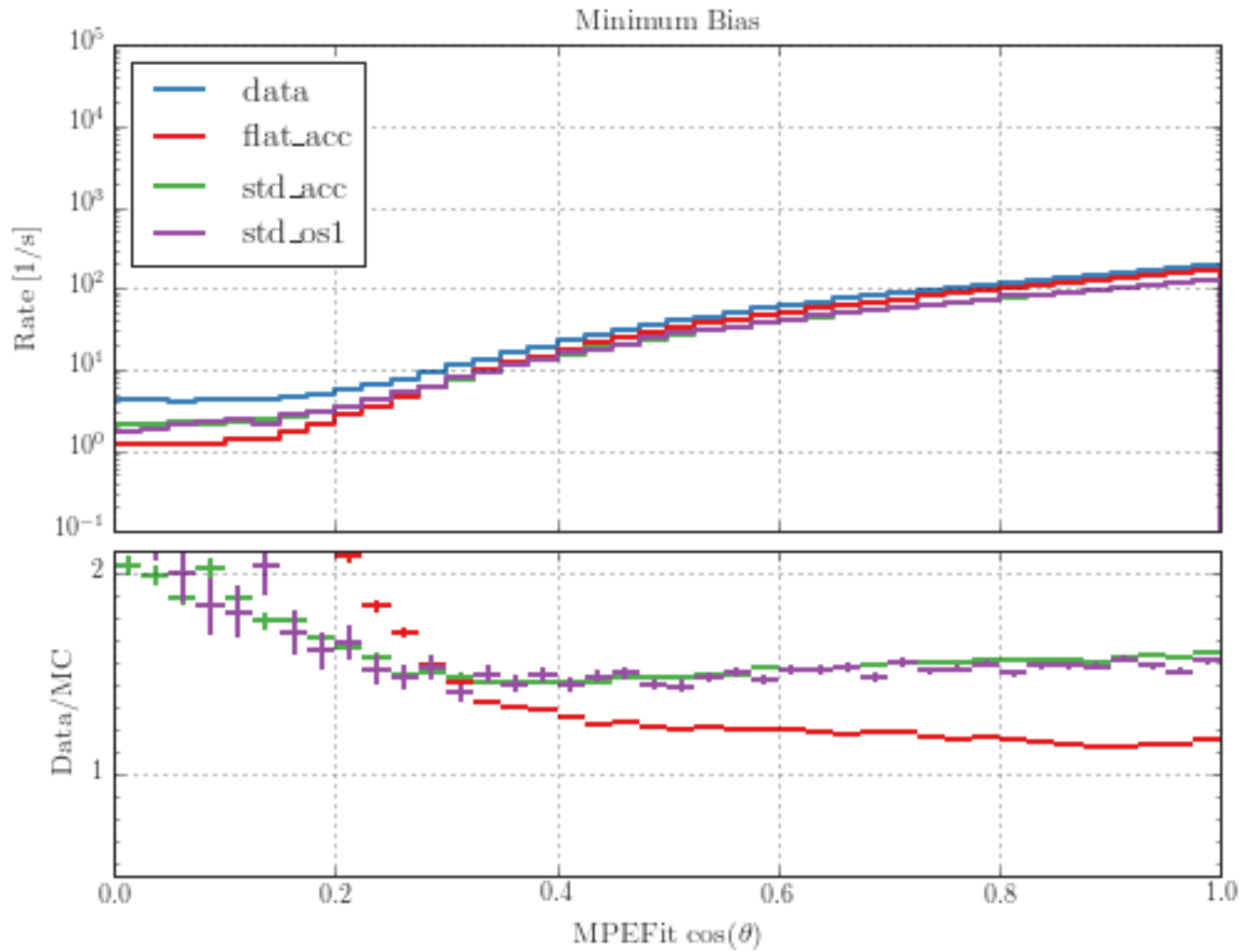
## ➤ 5component dcorsika

- Shared shower simulation, applied different angular response
- Flat and holeice, triggered and reconstructed individually
- No background simulation

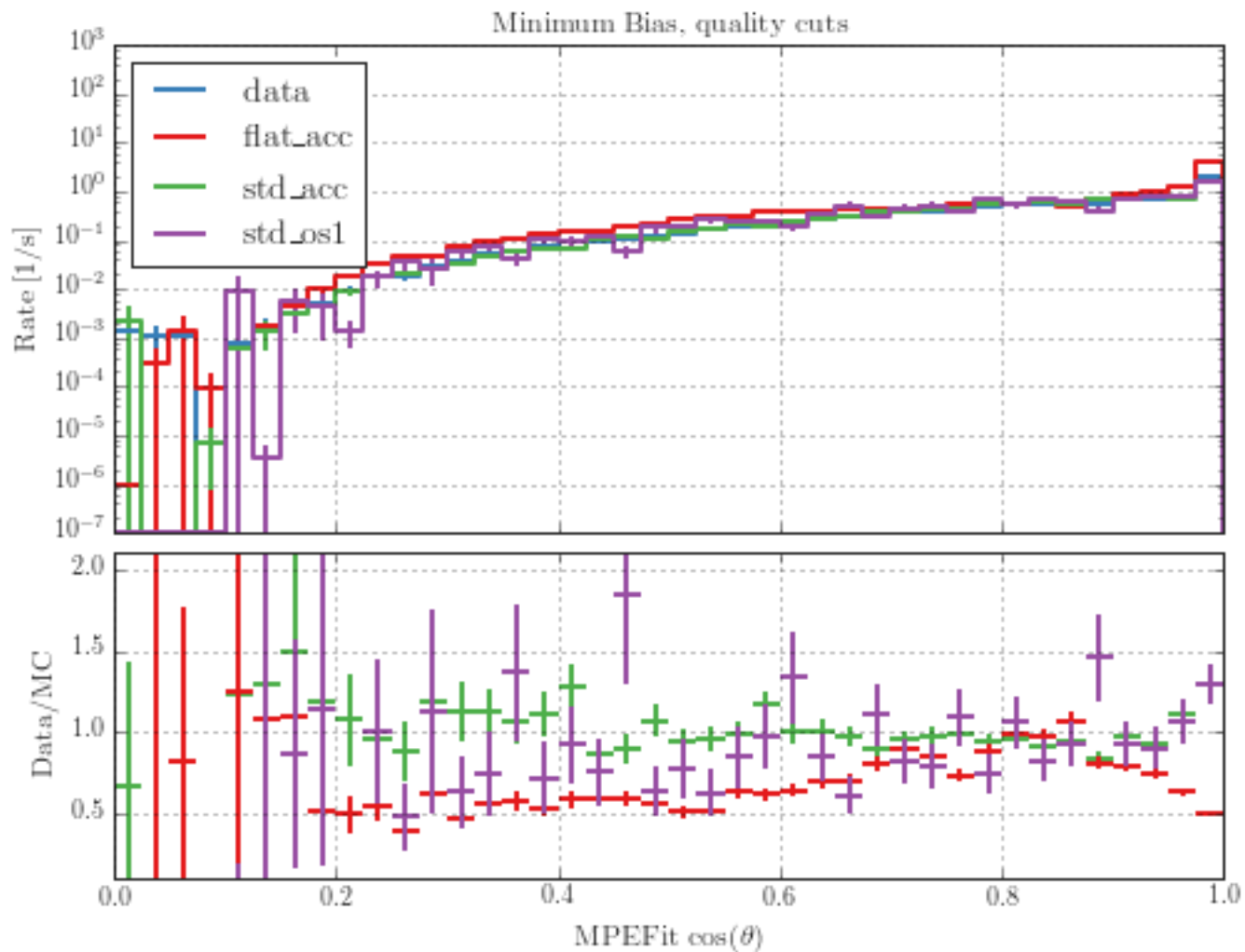
## ➤ Additional simulation with lower statistics and DOM oversizing of 1



# Trigger Level

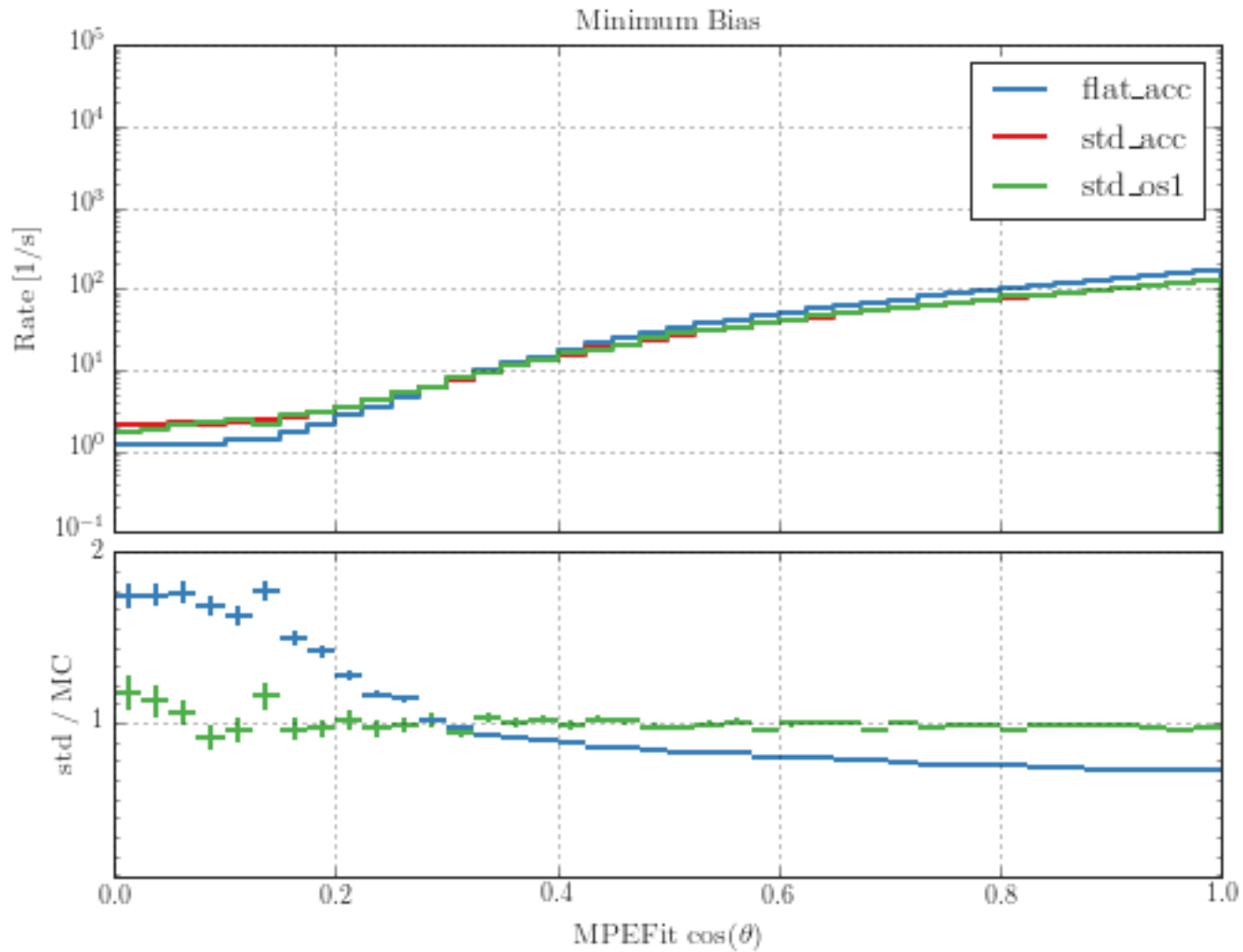


# Trigger Level Quality Cuts

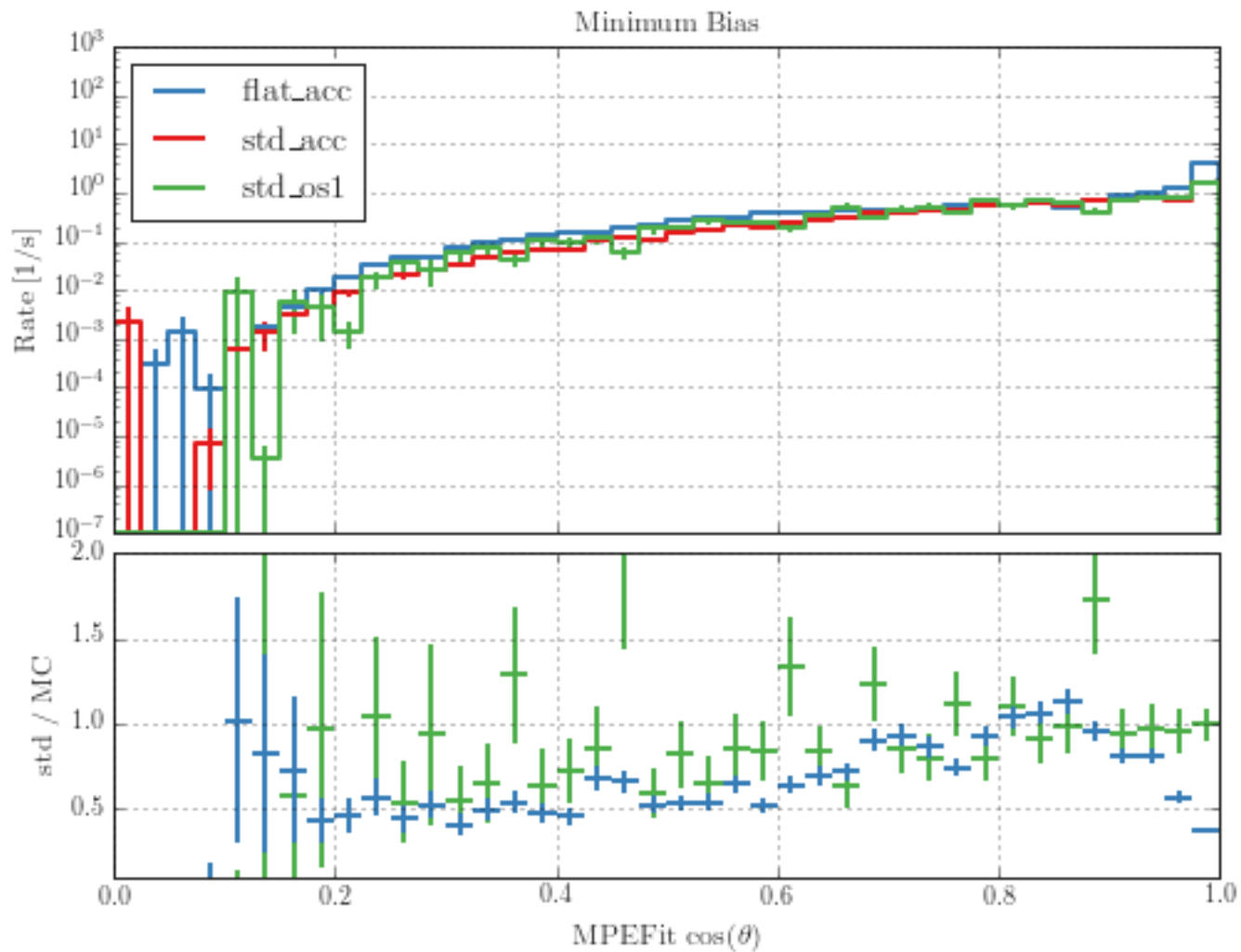




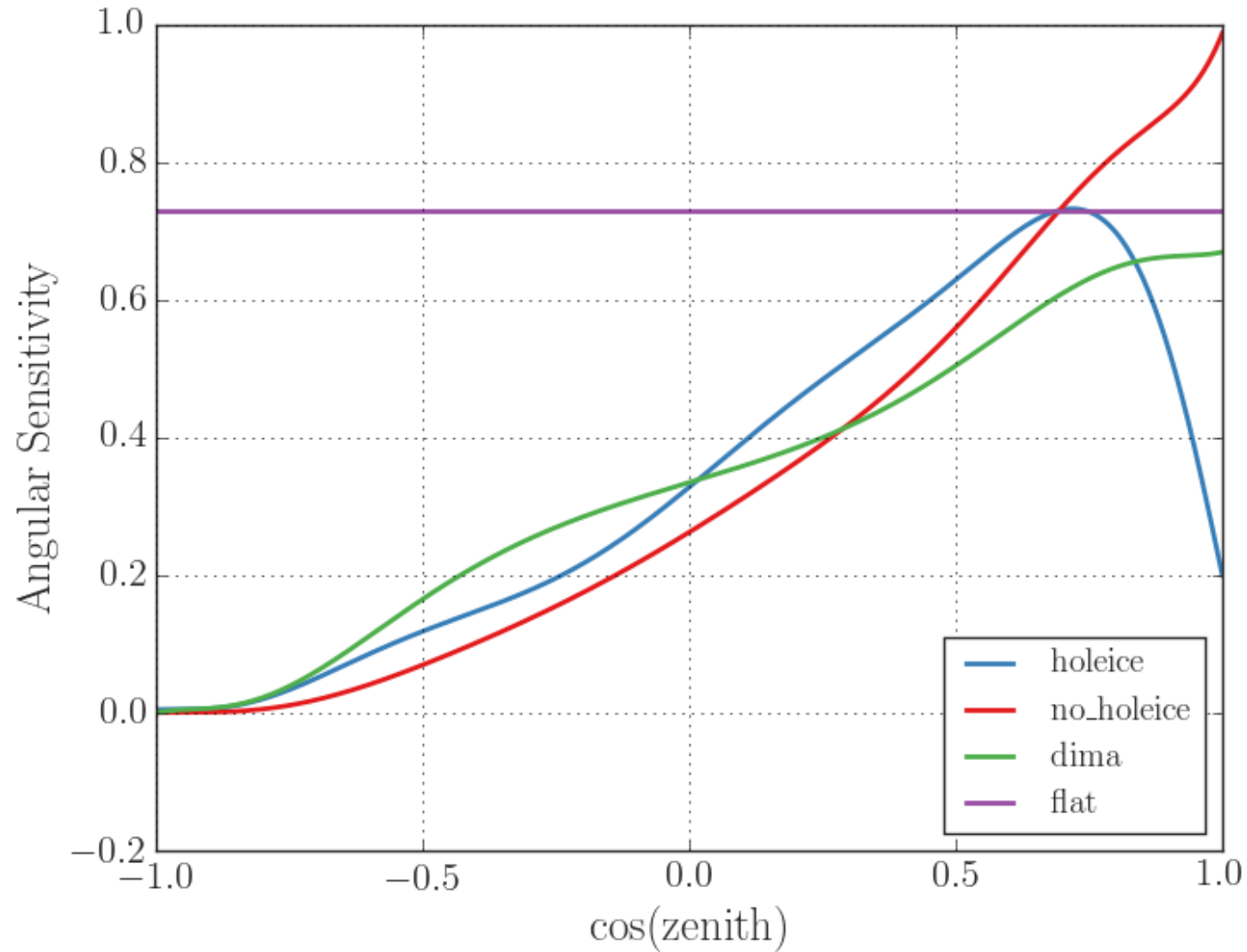
# Comparison of Simulation @ Trigger Level



# Trigger Level w/ Quality Cuts



# New Angular Sensitivity

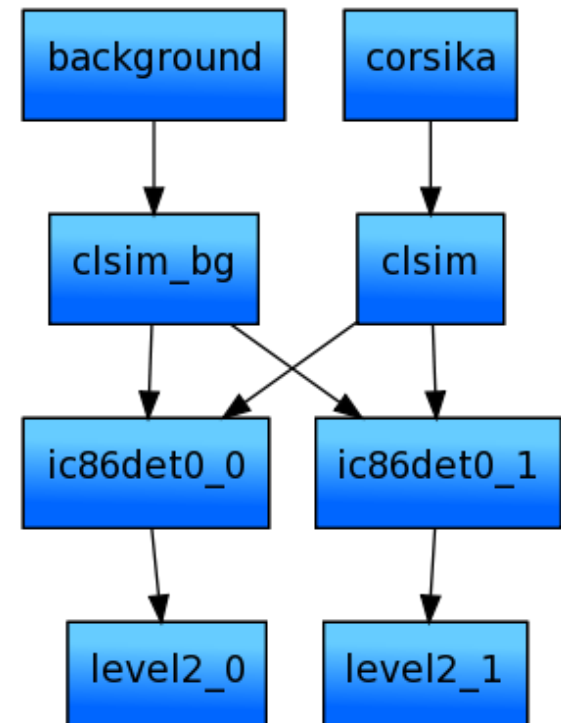


# New hole ice simulation

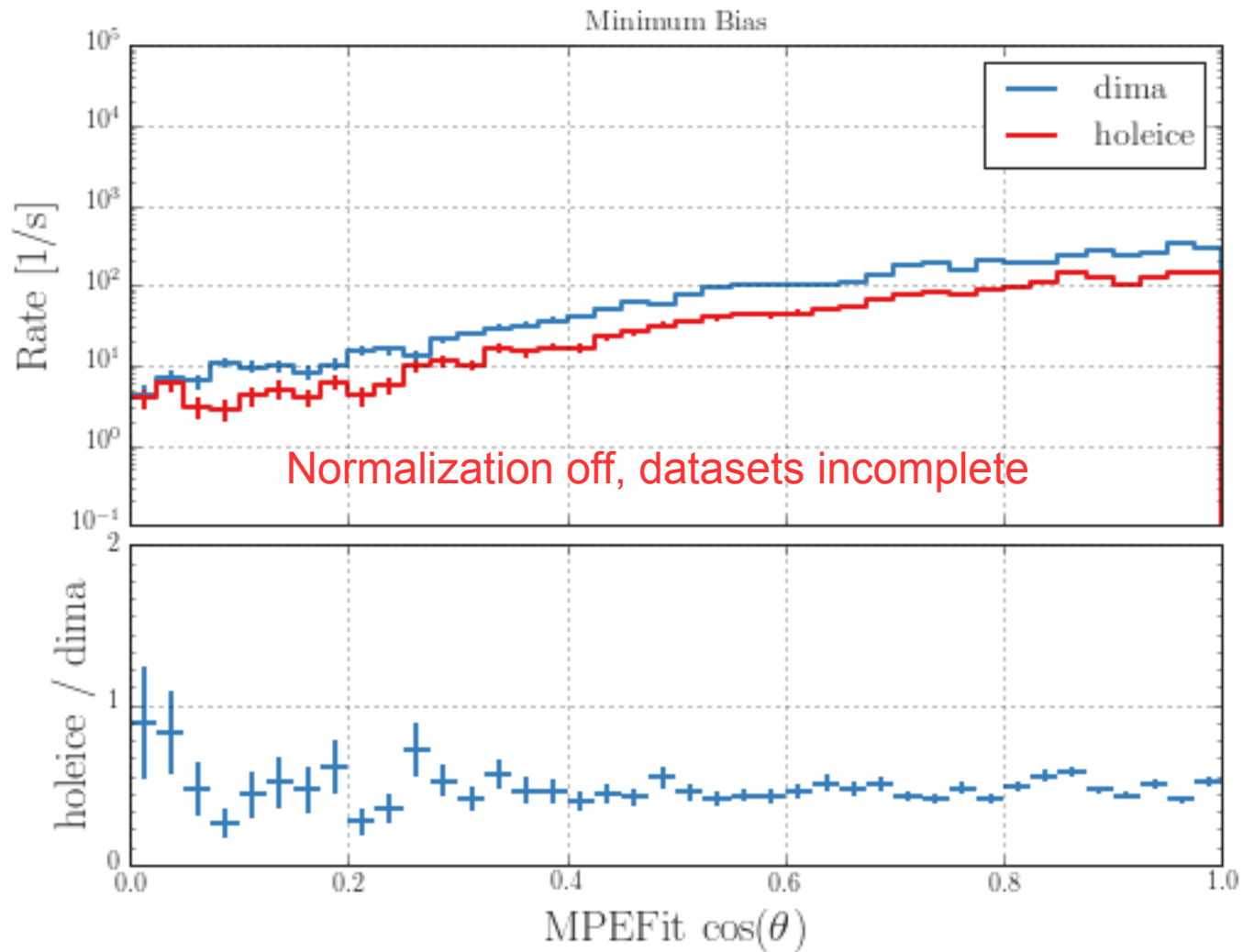
## ➤ Systematics (11635, 11698)

- 5 component LE + HE
- Angular sensitivity: holeice and “dima”
- Minimum Bias with prescale of 1
- Low statistics

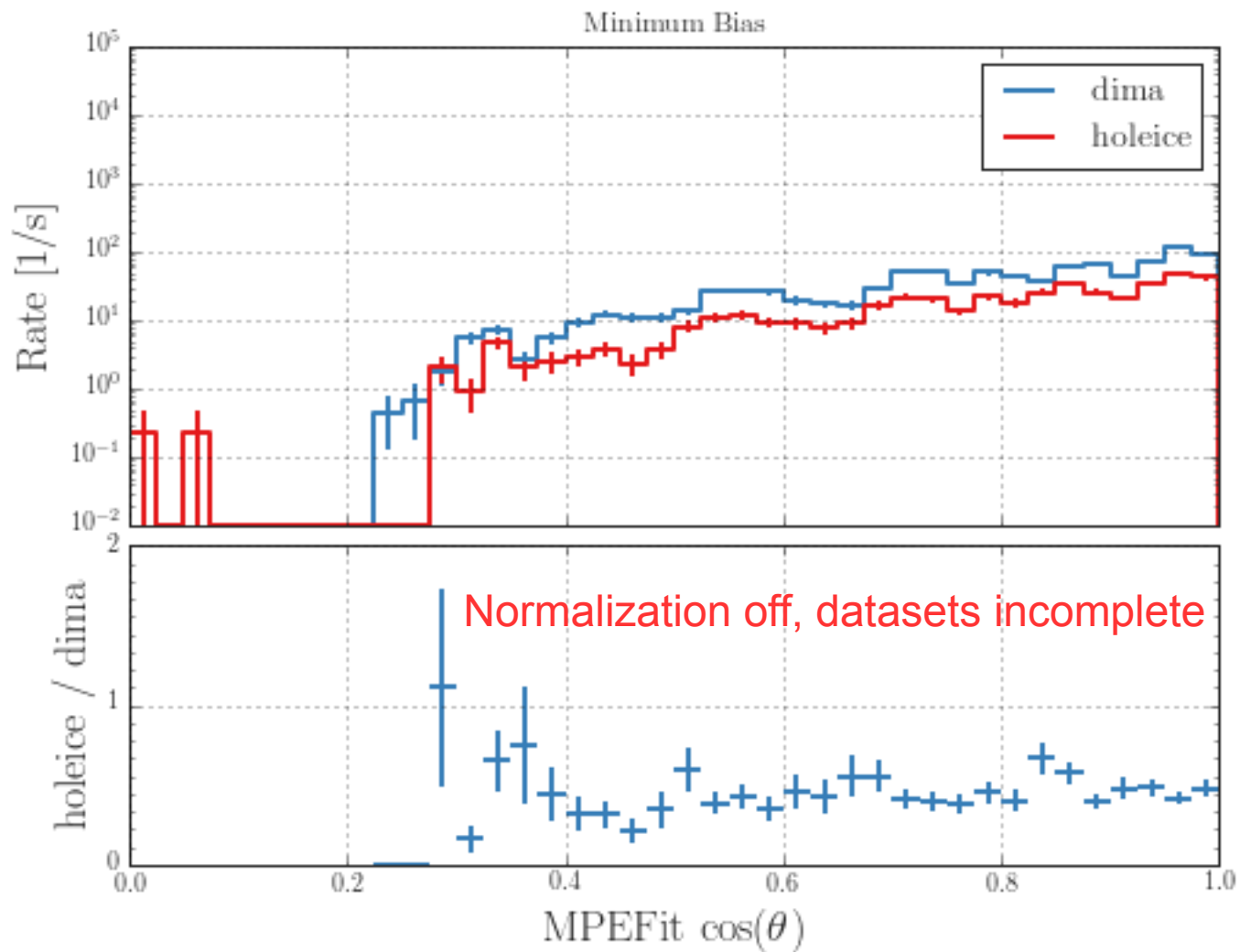
Simulation w/ different angular efficiency



# Trigger Level Comparison



# Trigger Level with Quality Cuts



# Summary

- Oversizing doesn't seem to have effect on zenith distribution for high quality tracks
- Extrem case of flat DOM Angular Sensitivity shows some effect
- Simulation of new hole ice fit compared to old hole ice shows no influence, update when simulation finished

