

# MODIS L1B Radiometric Assessment

$A_0 = 0$  for all TEB

Chris Moeller

Univ. Wisconsin

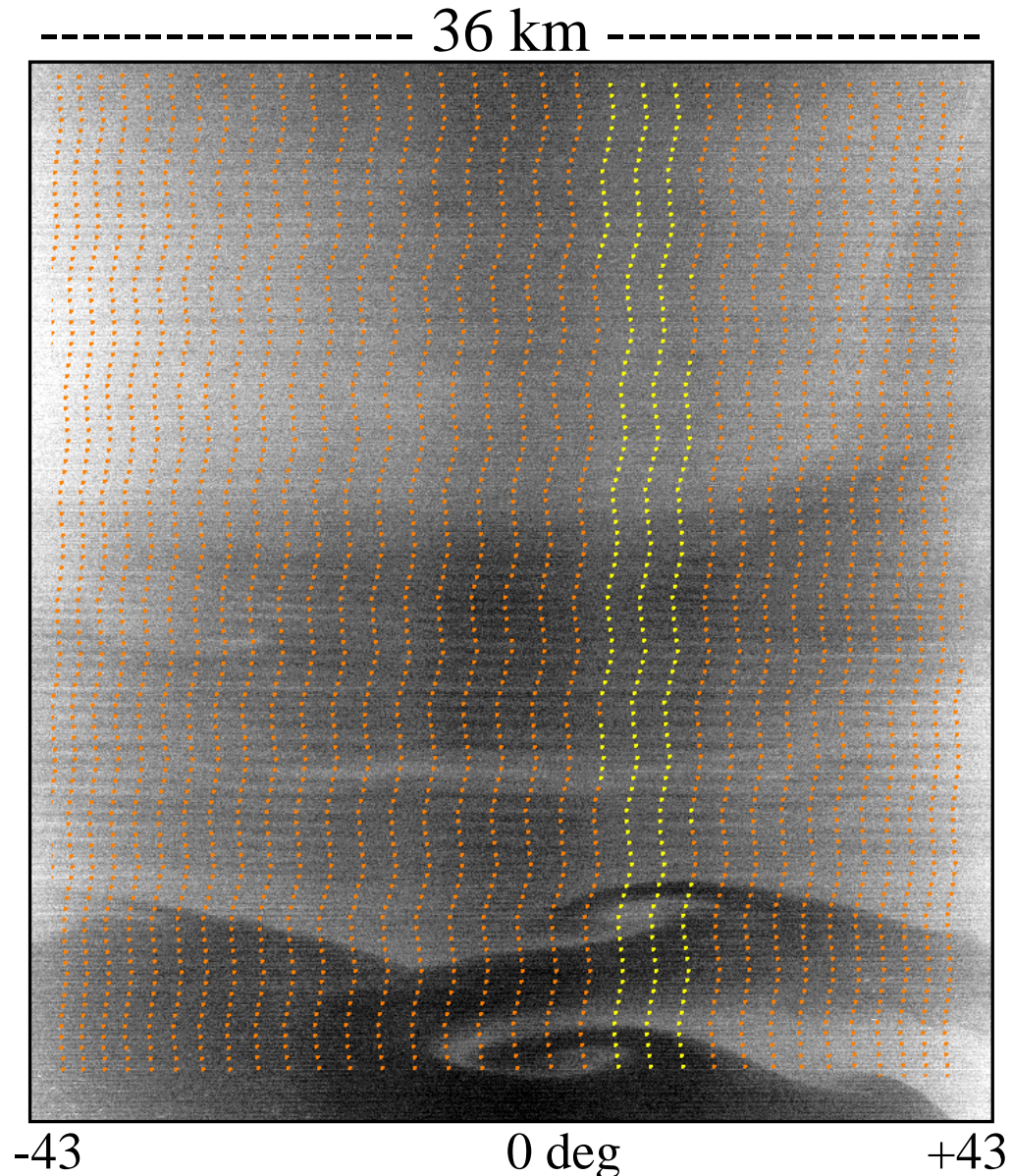
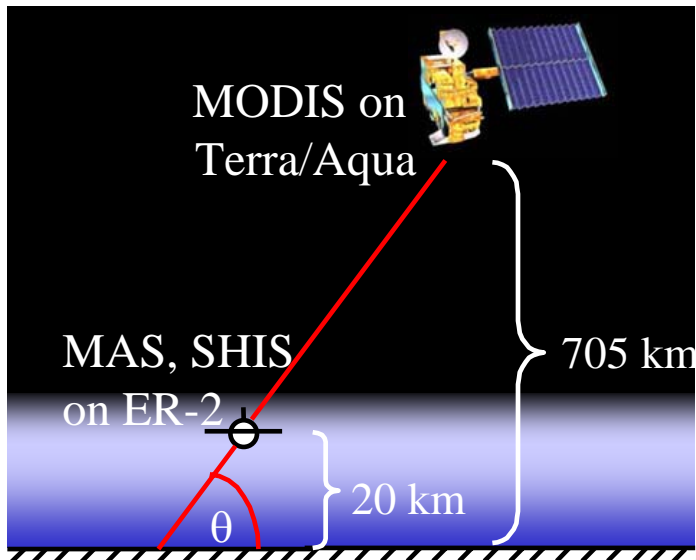
Jan 30, 2008

MODIS Calibration Workshop

# MAS 11 $\mu\text{m}$ image w/MODIS matchups

- MODIS Collect 5 data
- SHIS calibration tied to NIST

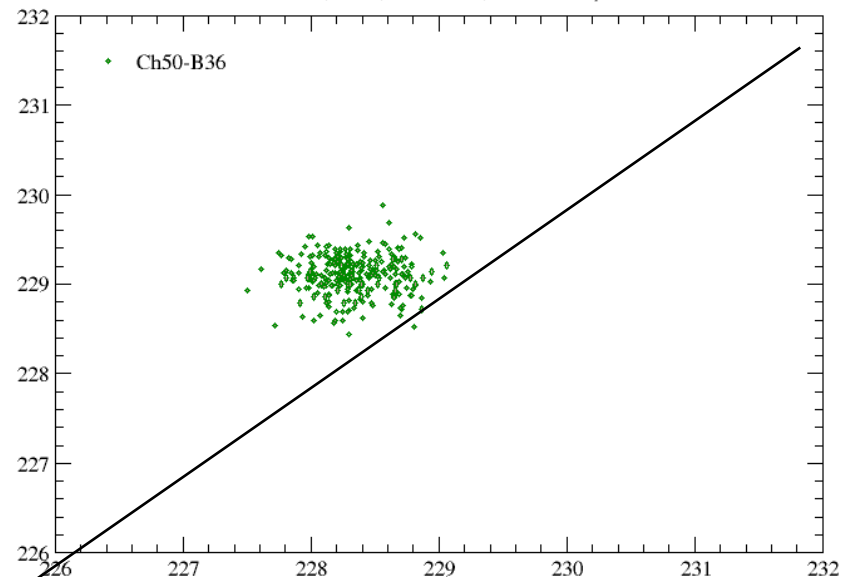
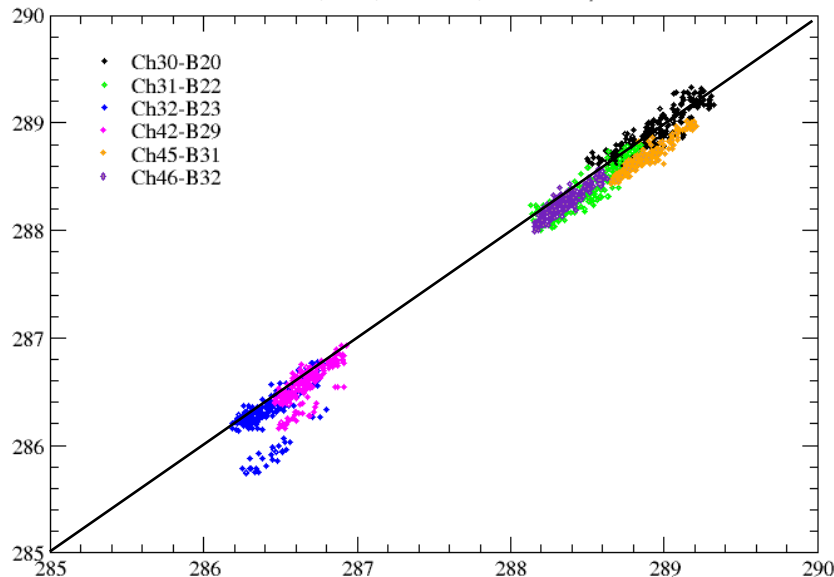
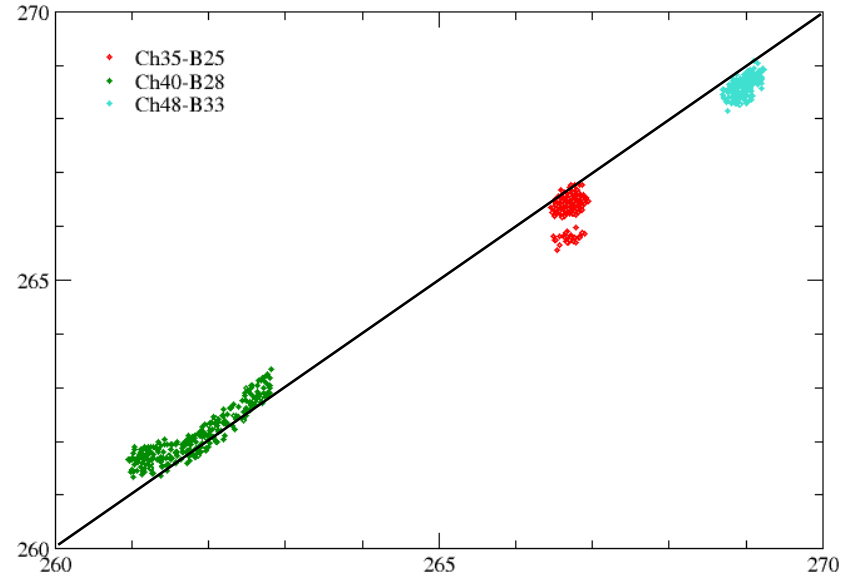
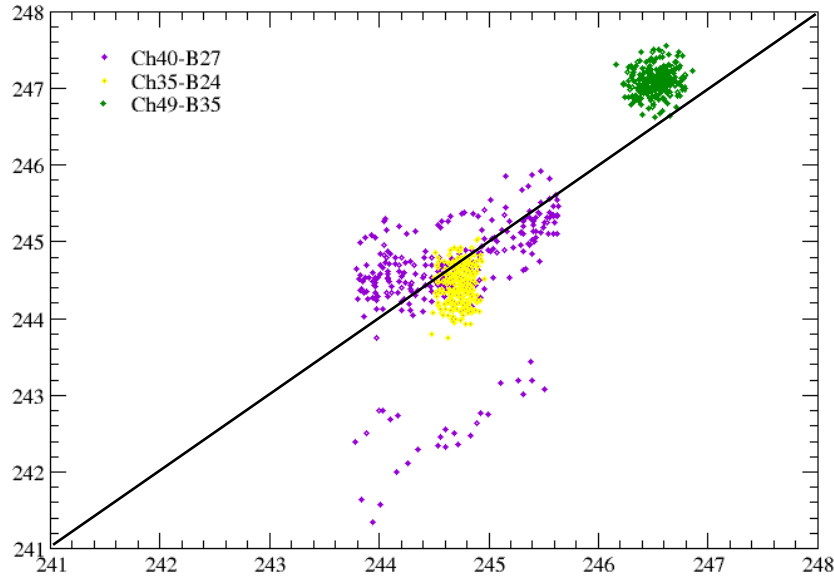
Yellow MODIS footprints match MAS offnadir view angle to target (13 deg)



# Aqua MODIS L1B Assessment Scattergrams

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors

MODIS Observations



MODIS Predictions

MODIS Predictions

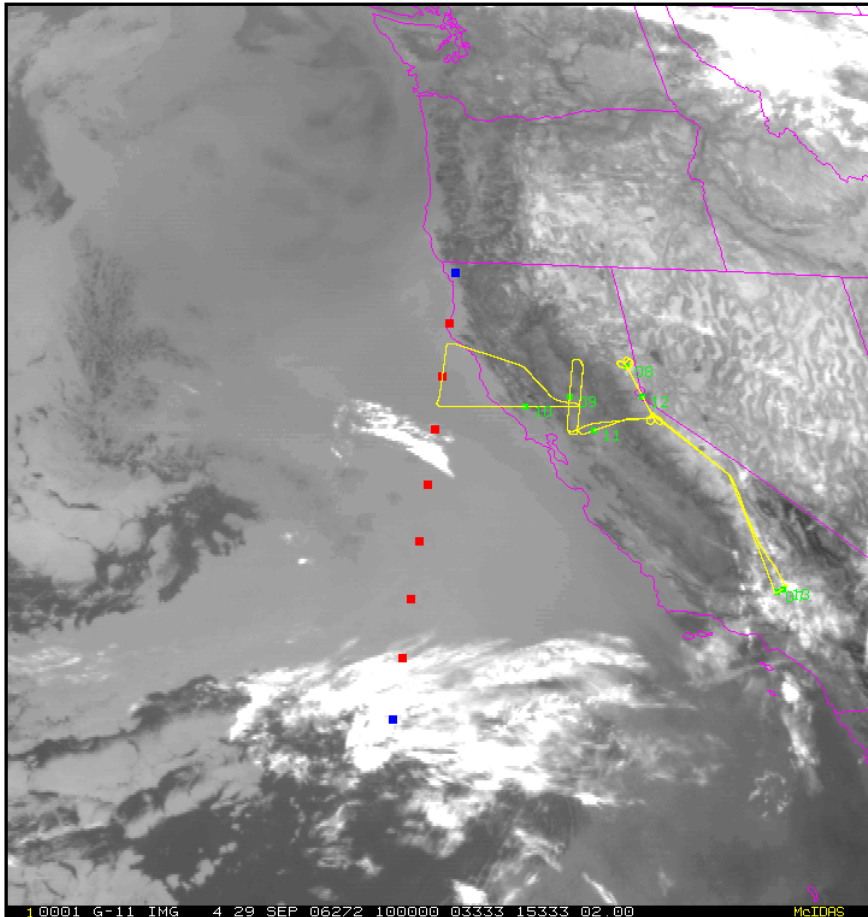


# Tahoe 2006 ER-2 Flights

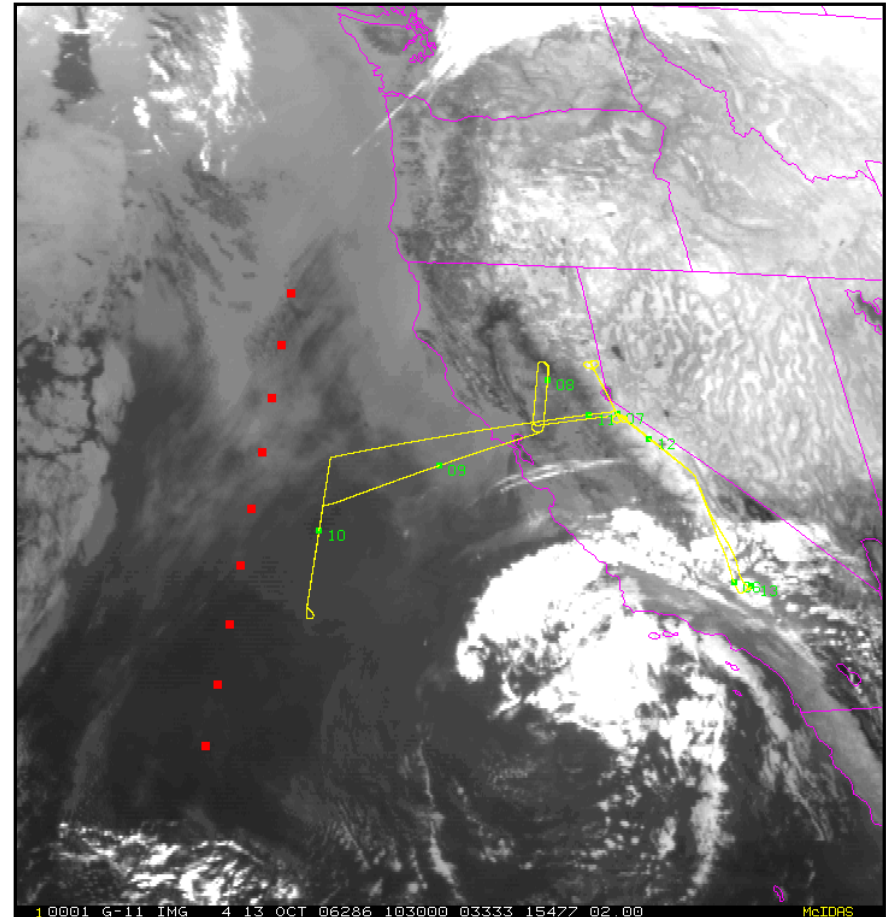


- MODIS/AIRS TIR Band Cal/Val
- AIRS Surface Emissivity Studies
- SHIS, MAS, MASTER Cal/Val

ER-2 Flight Pattern on Sept 28-29, 2006

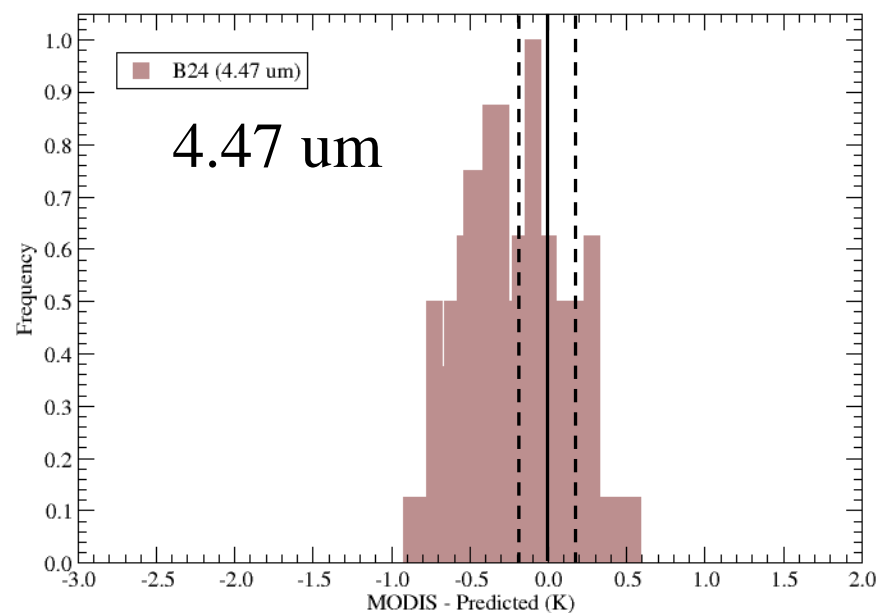
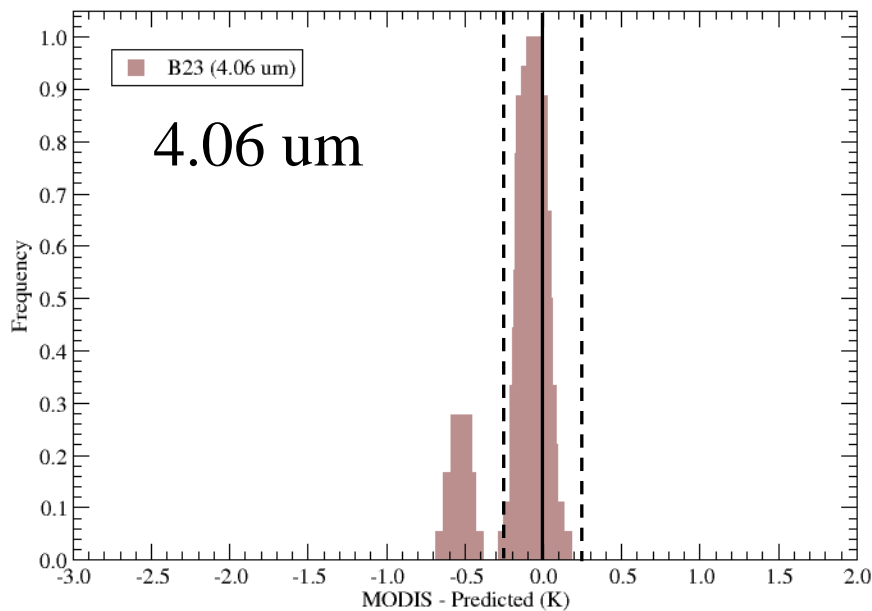
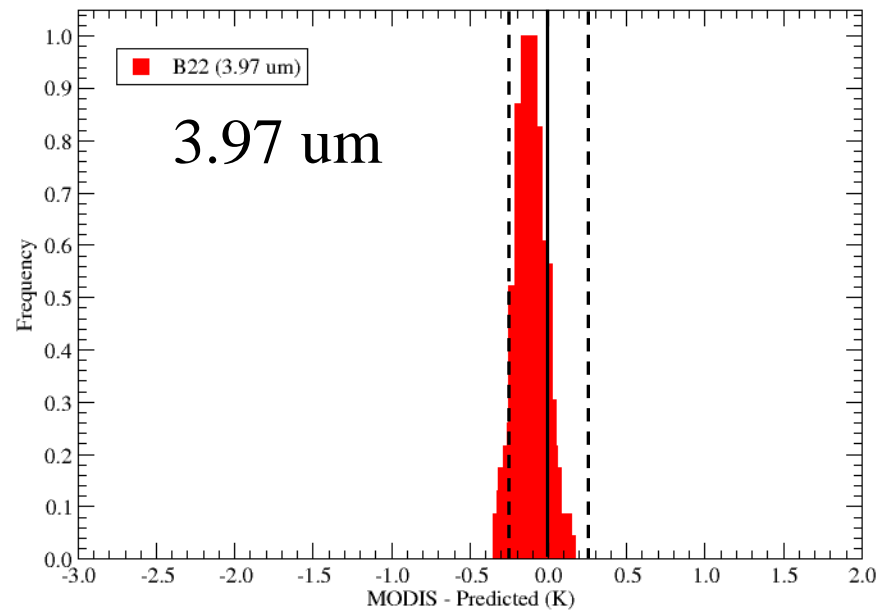
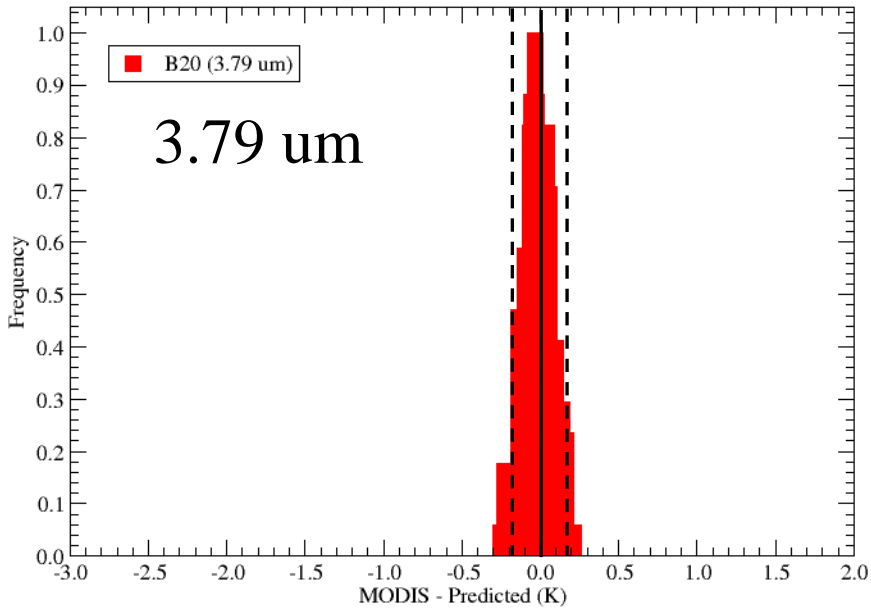


ER-2 Flight Pattern on Oct 12-13, 2006



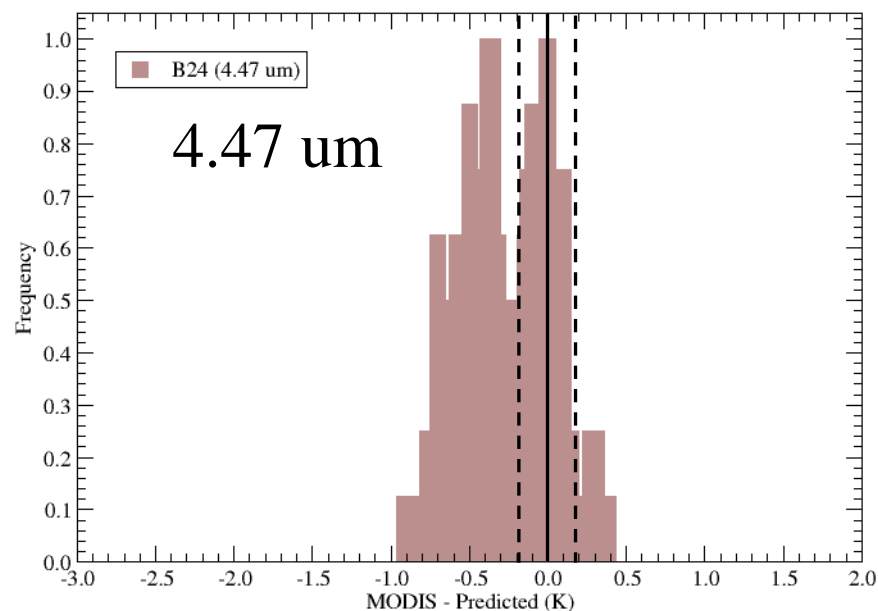
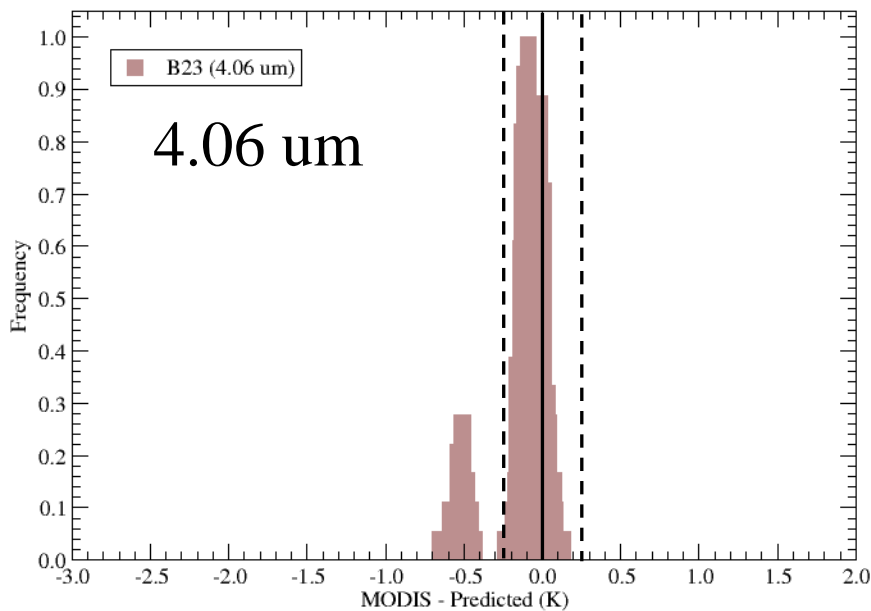
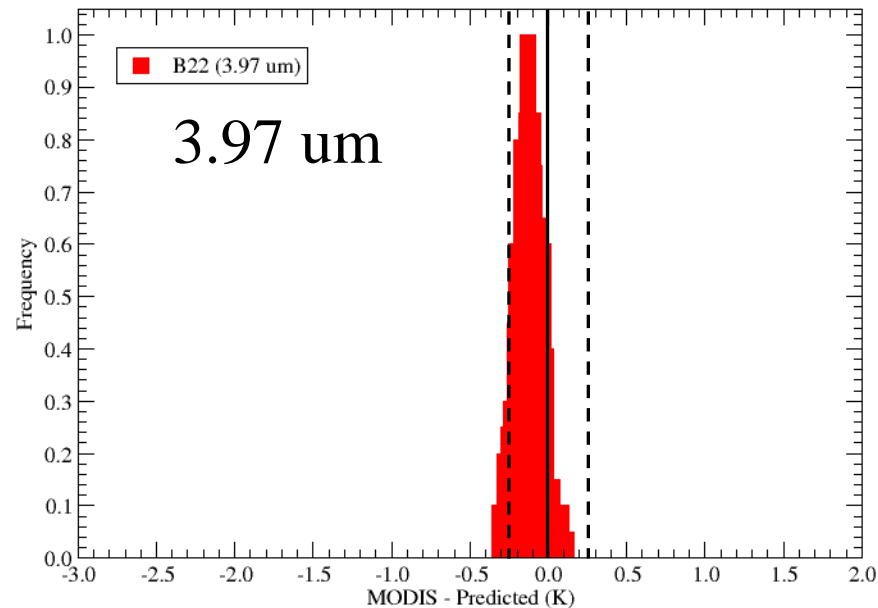
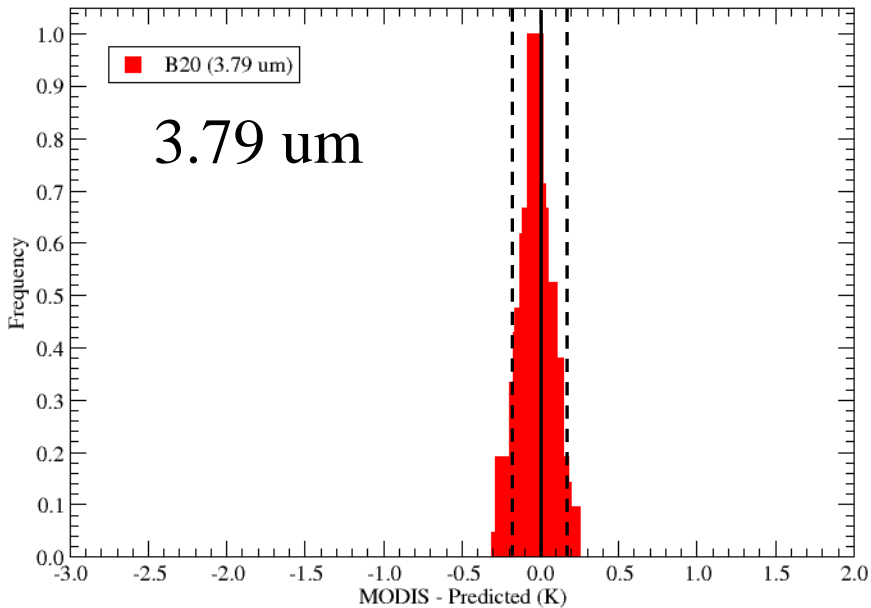
# Aqua MODIS L1B Assessment Histograms

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors



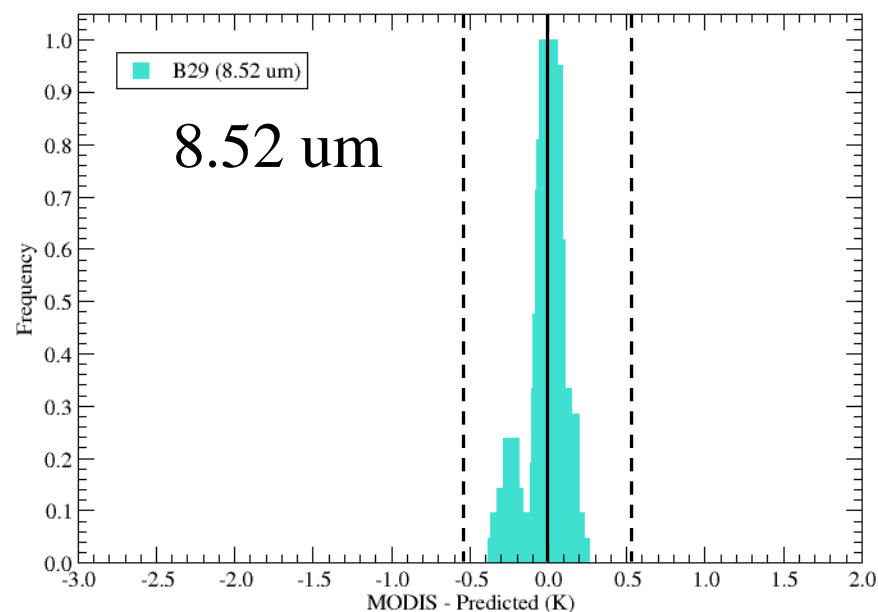
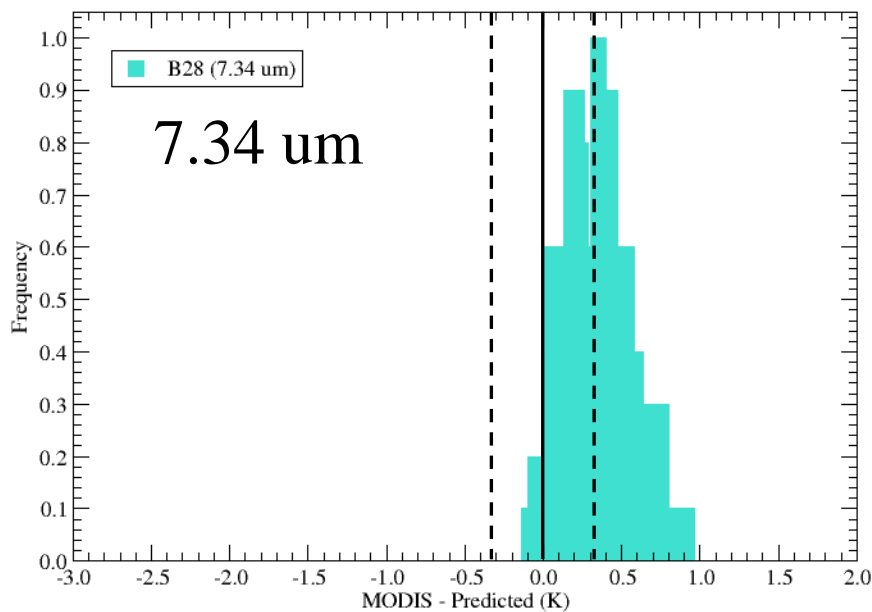
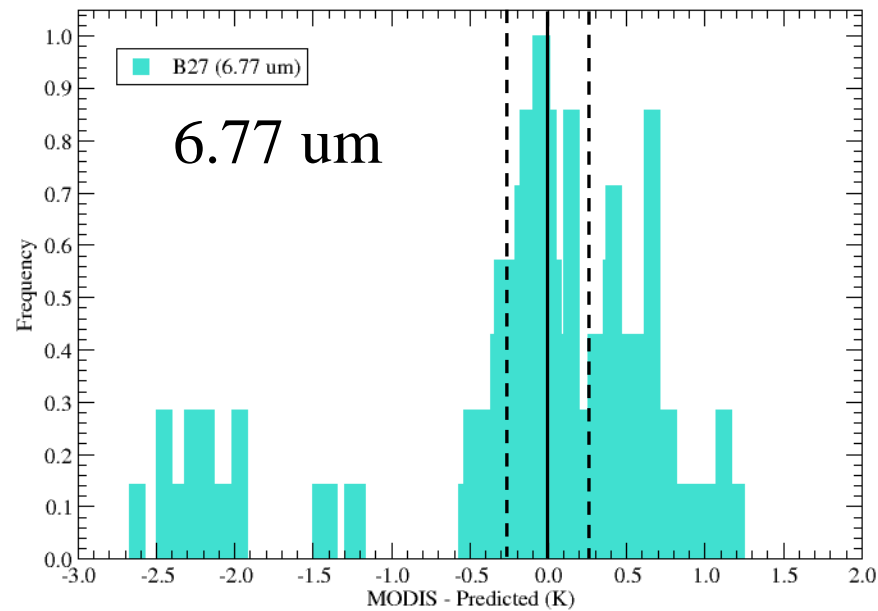
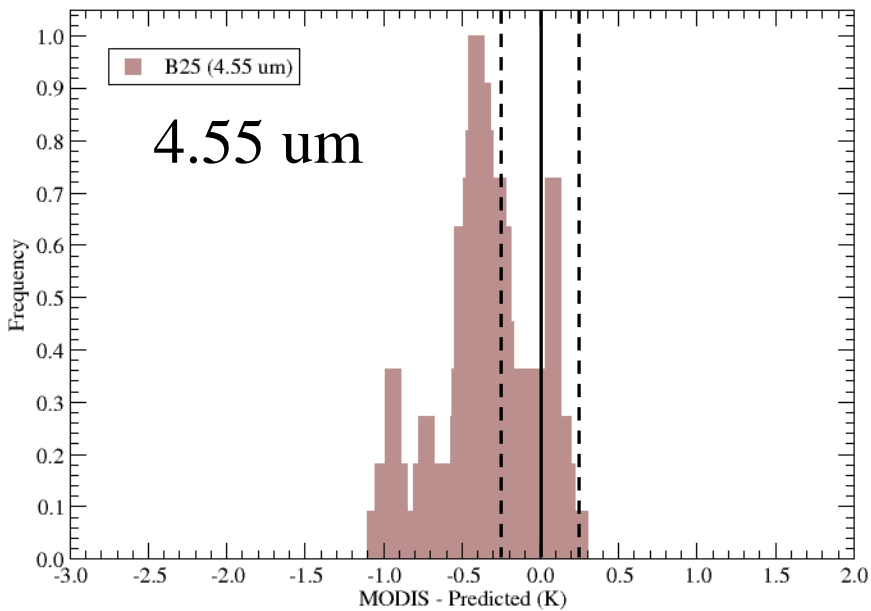
# Aqua MODIS L1B Assessment Histograms

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors; V6 Test



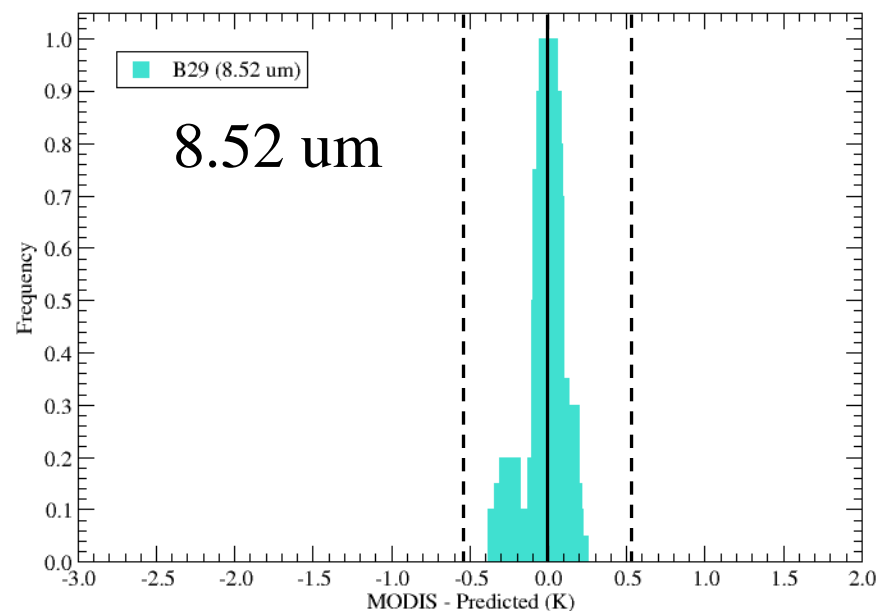
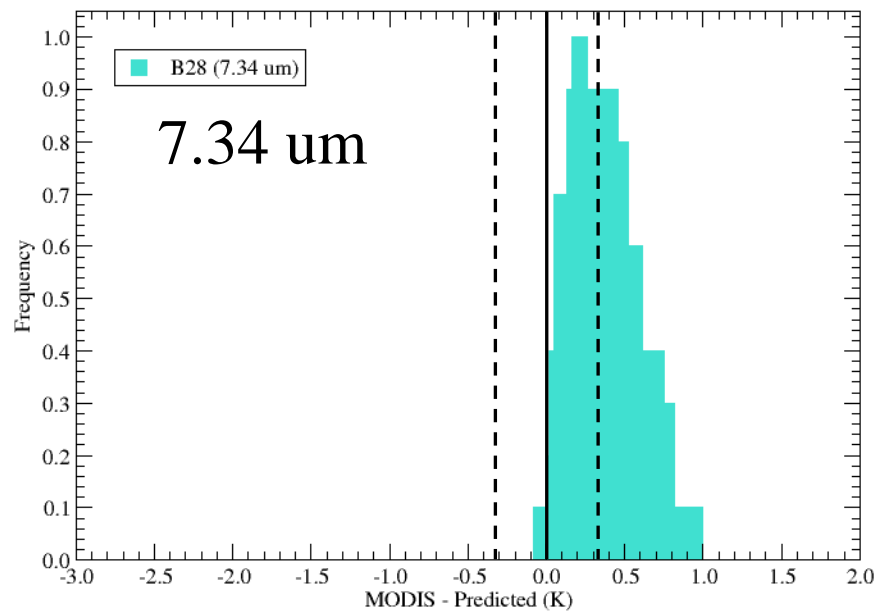
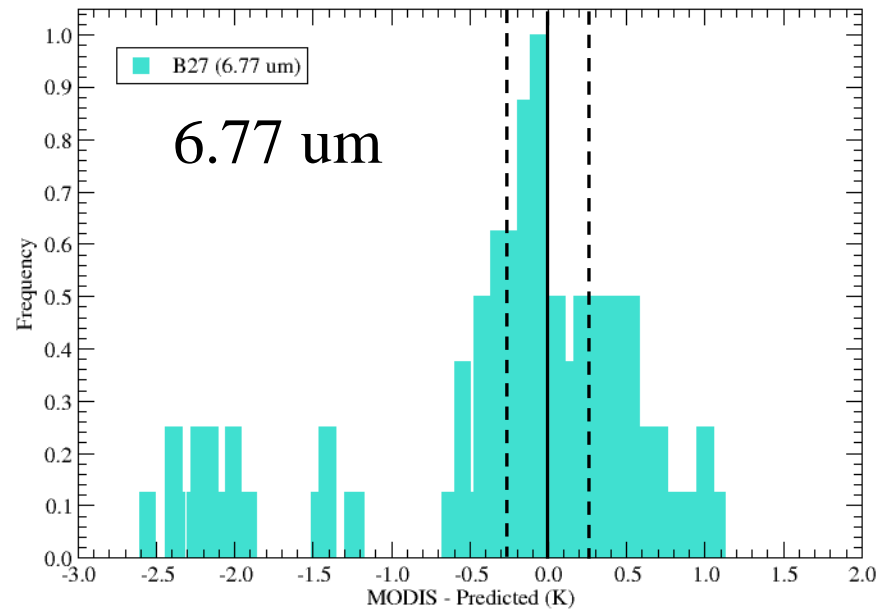
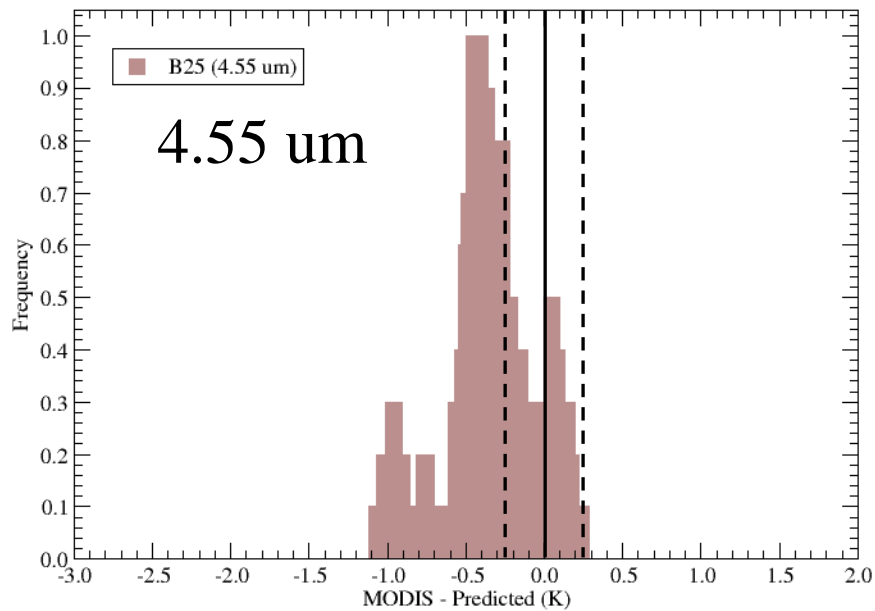
# Aqua MODIS L1B Assessment Histograms

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors



# Aqua MODIS L1B Assessment Histograms

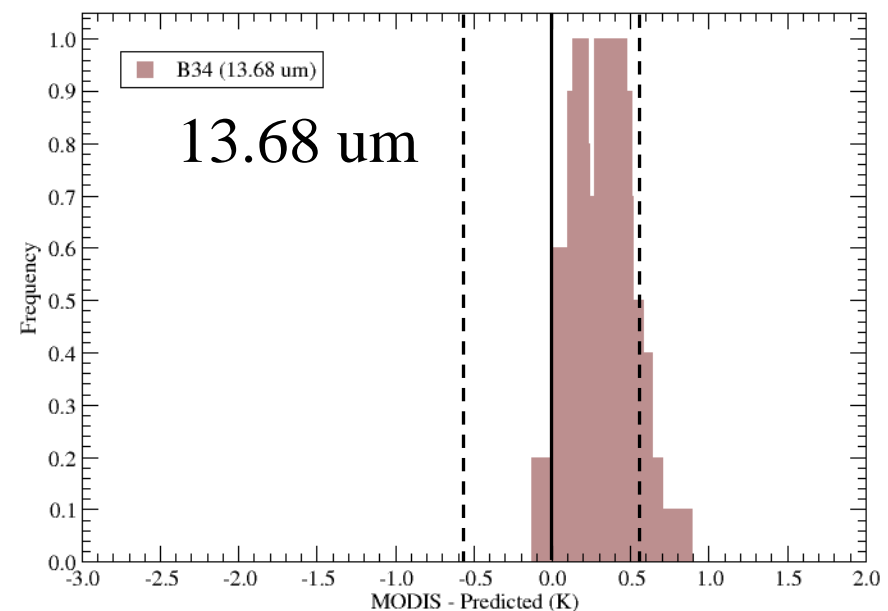
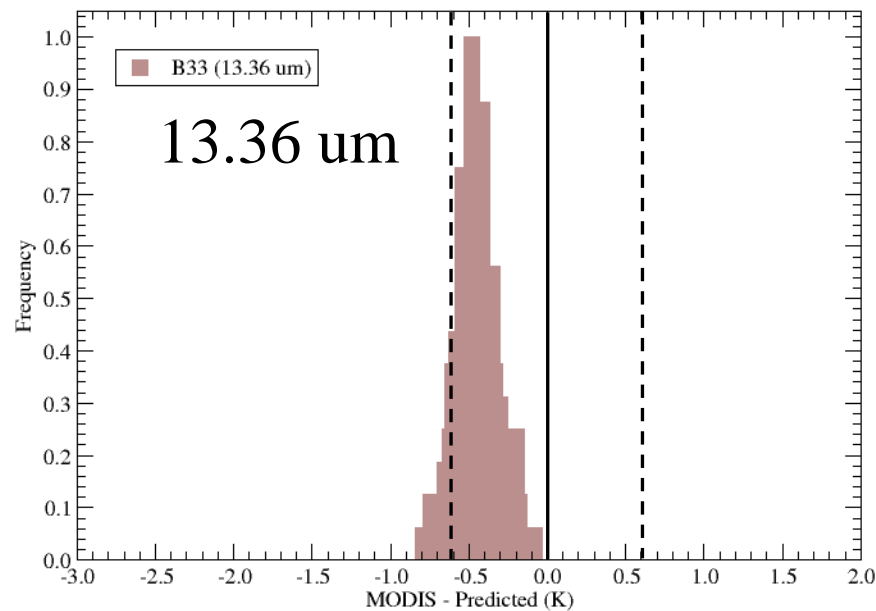
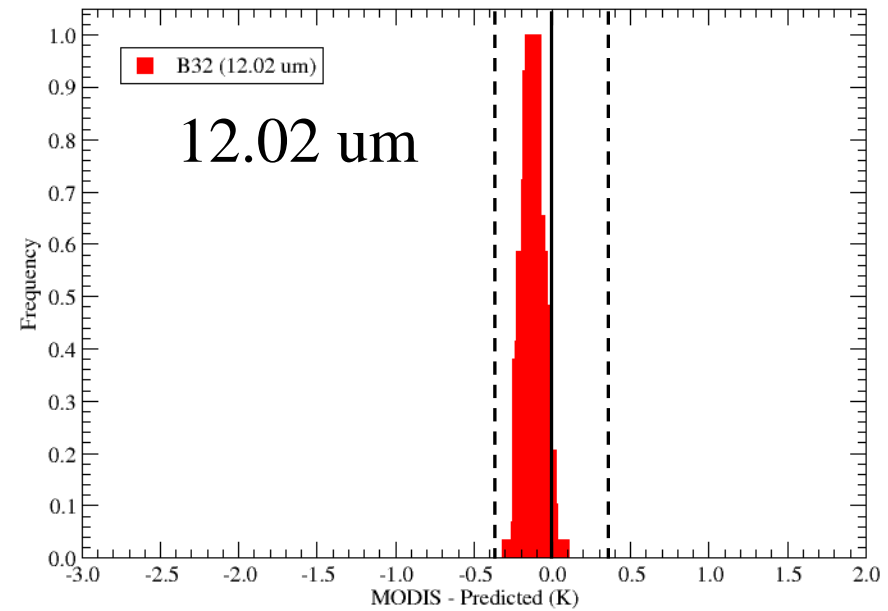
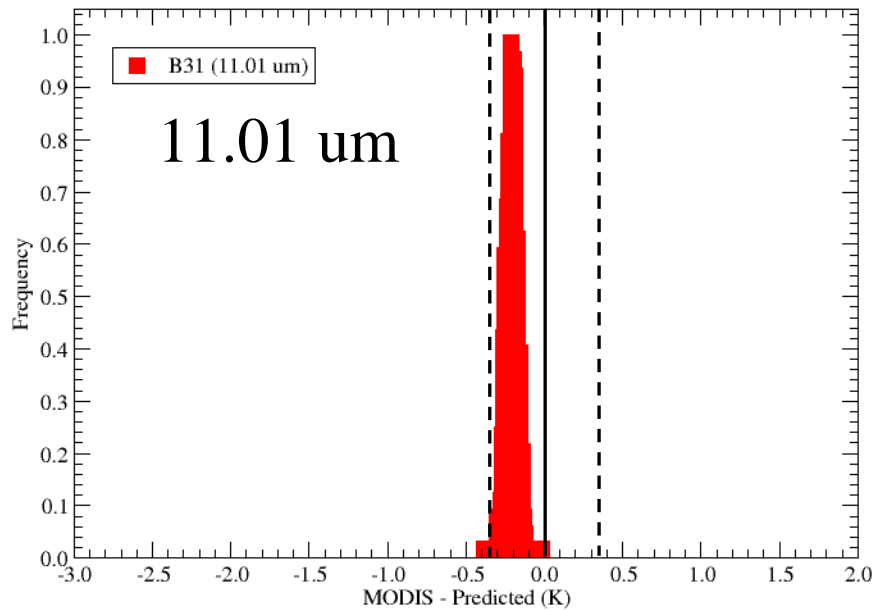
Oct 13, 2006; Track L-K; 286 Matchups; All Detectors; V6 Test





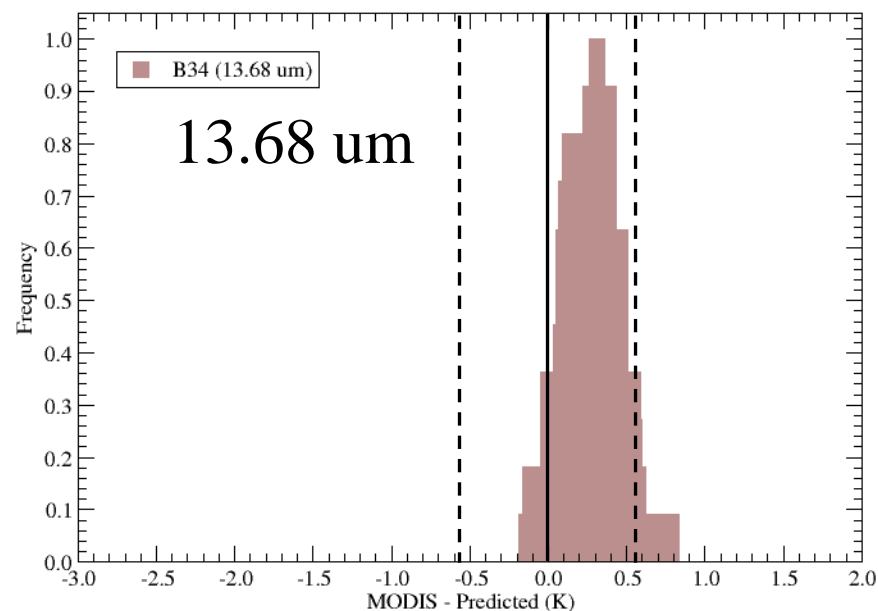
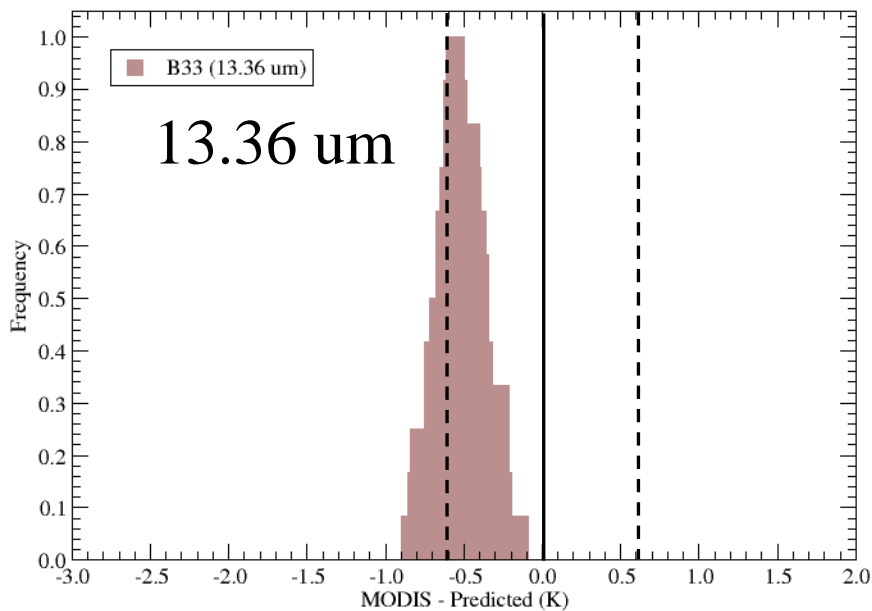
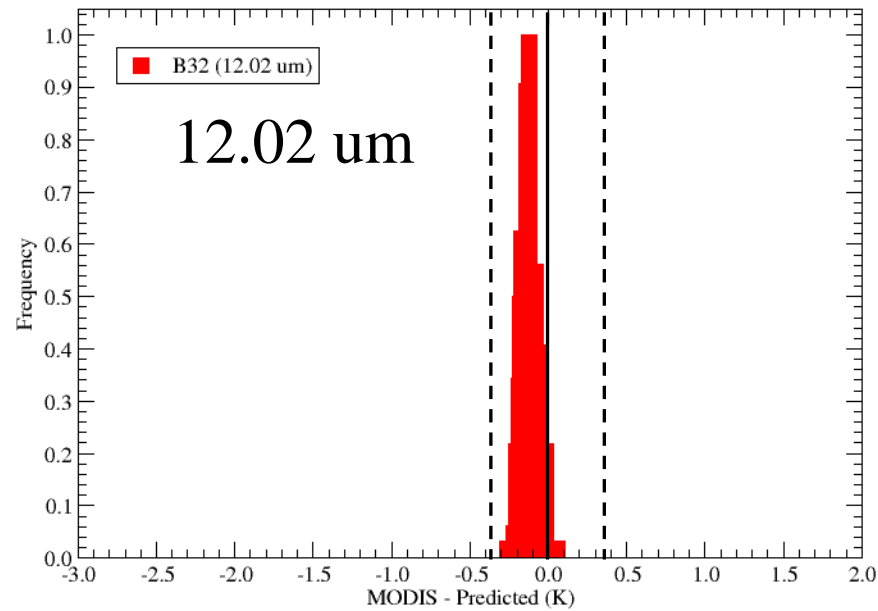
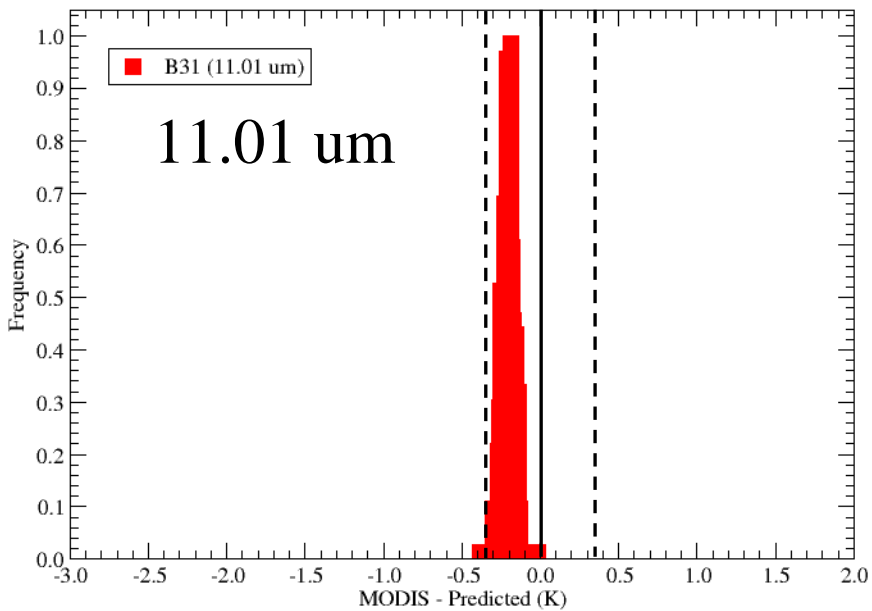
# Aqua MODIS L1B Assessment Histograms

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors



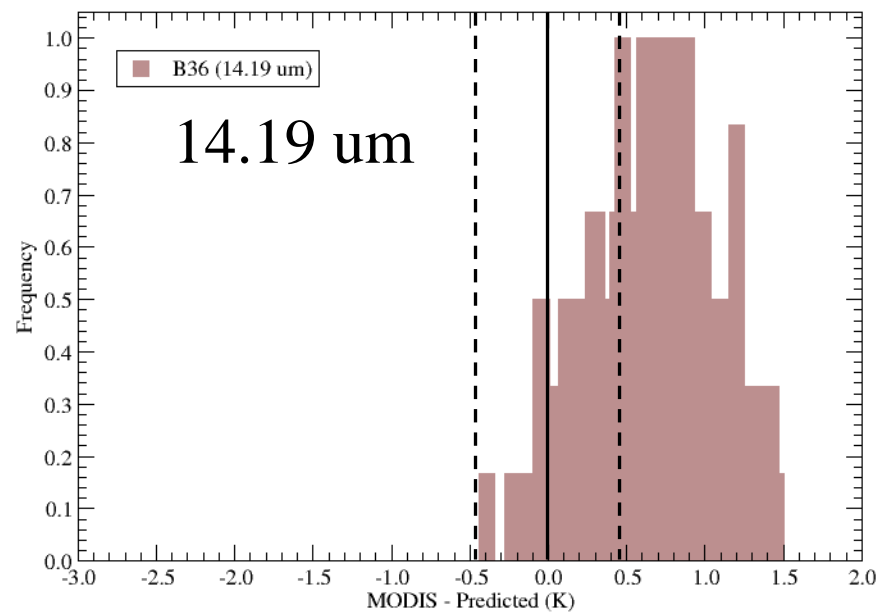
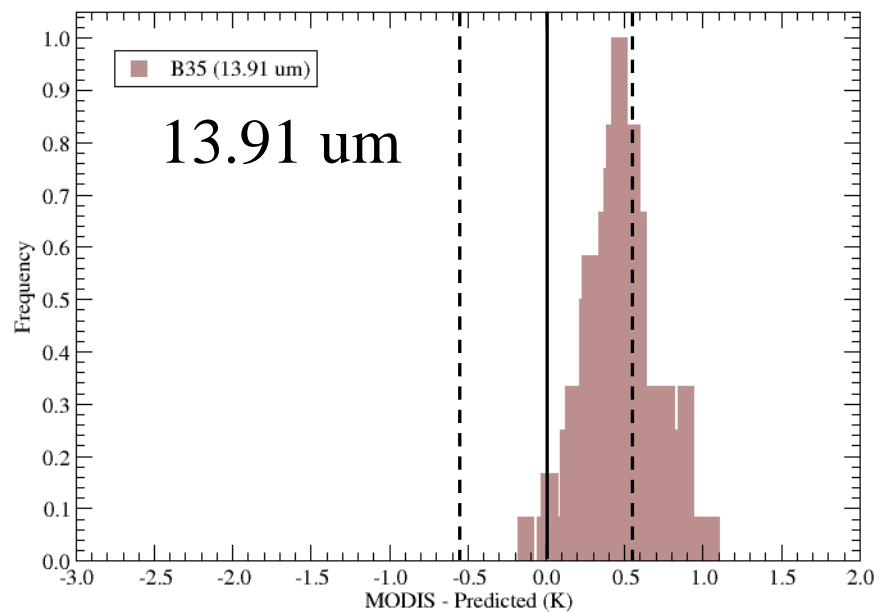
# Aqua MODIS L1B Assessment Histograms

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors; V6 Test



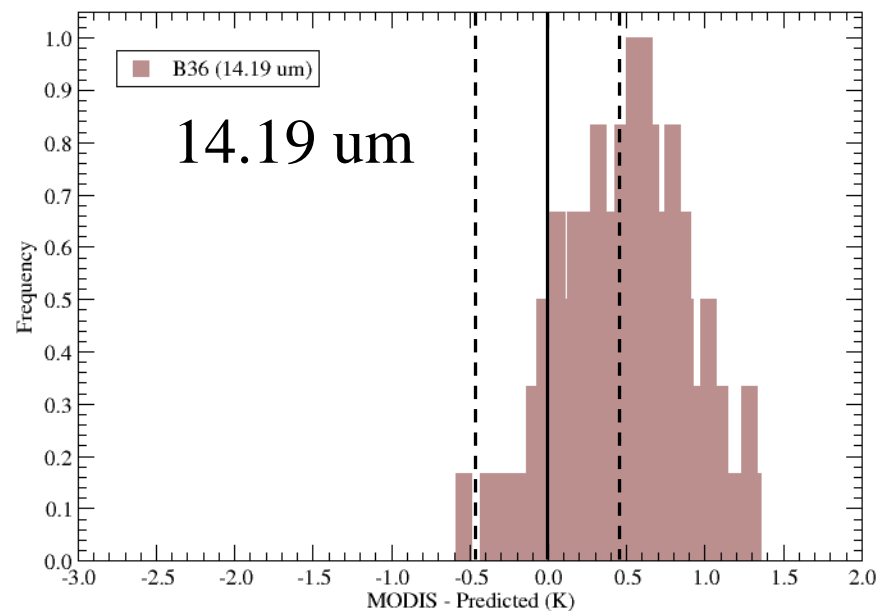
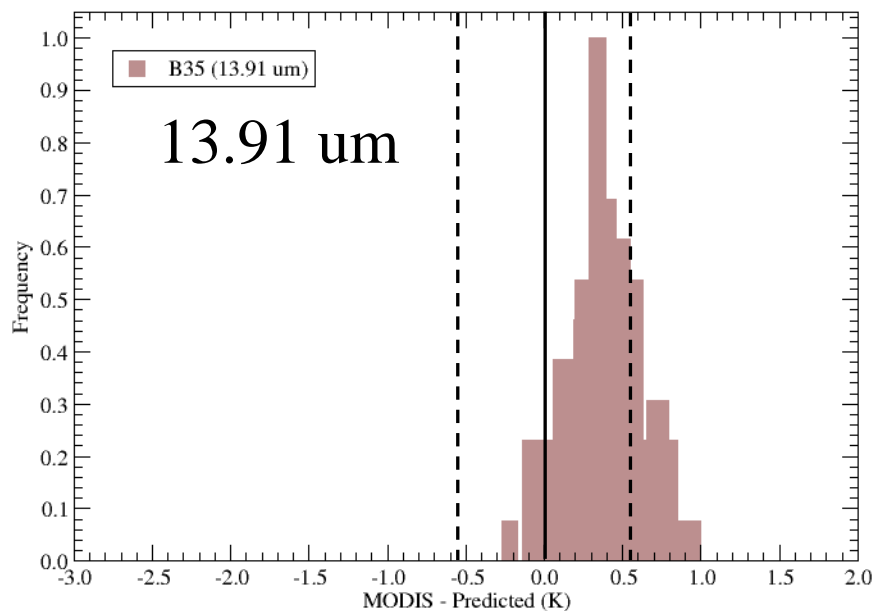
# Aqua MODIS L1B Assessment Histograms

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors



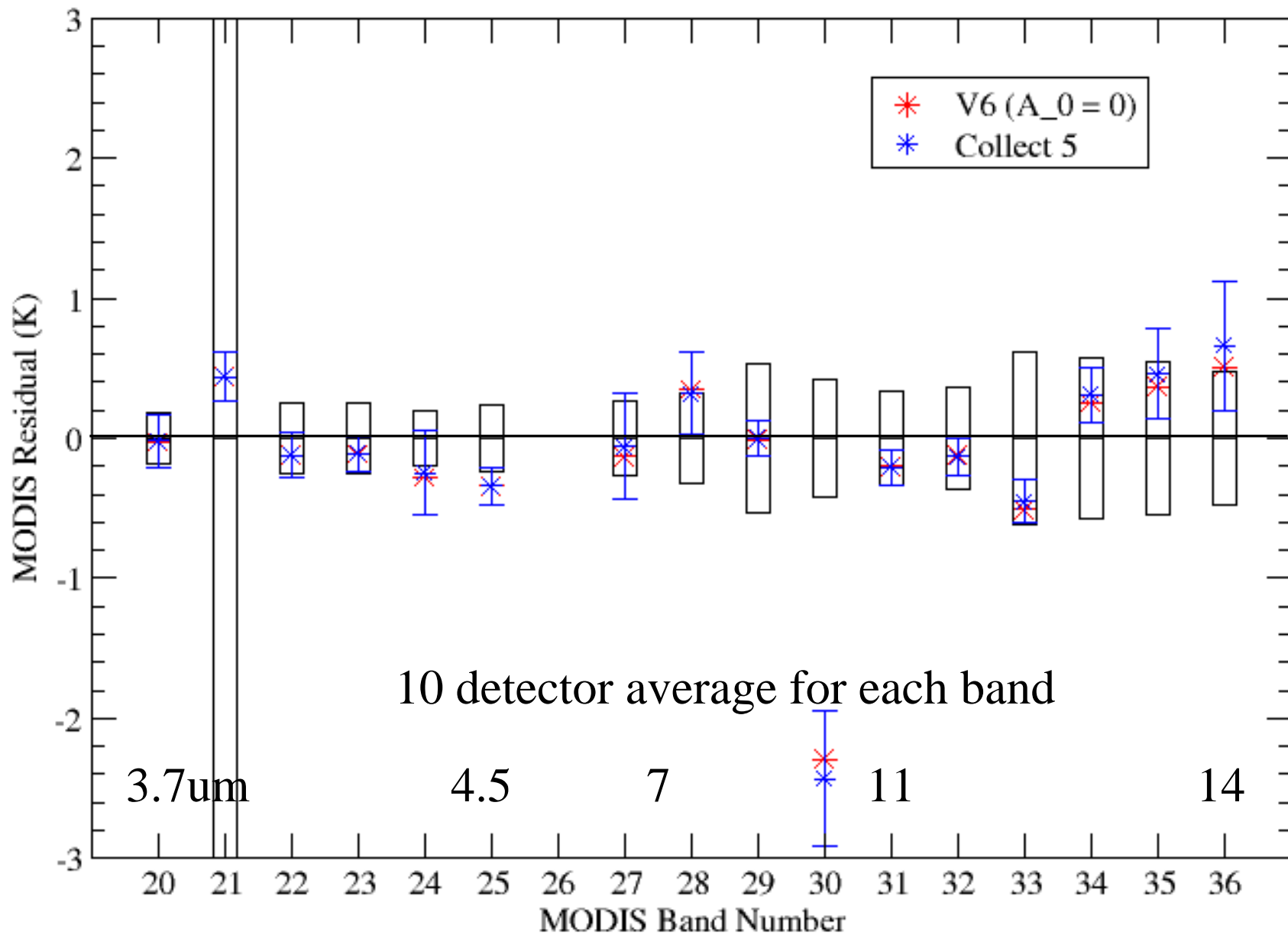
# Aqua MODIS L1B Assessment Histograms

Oct 13, 2006; Track L-K; 286 Matchups; All Detectors; V6 Test



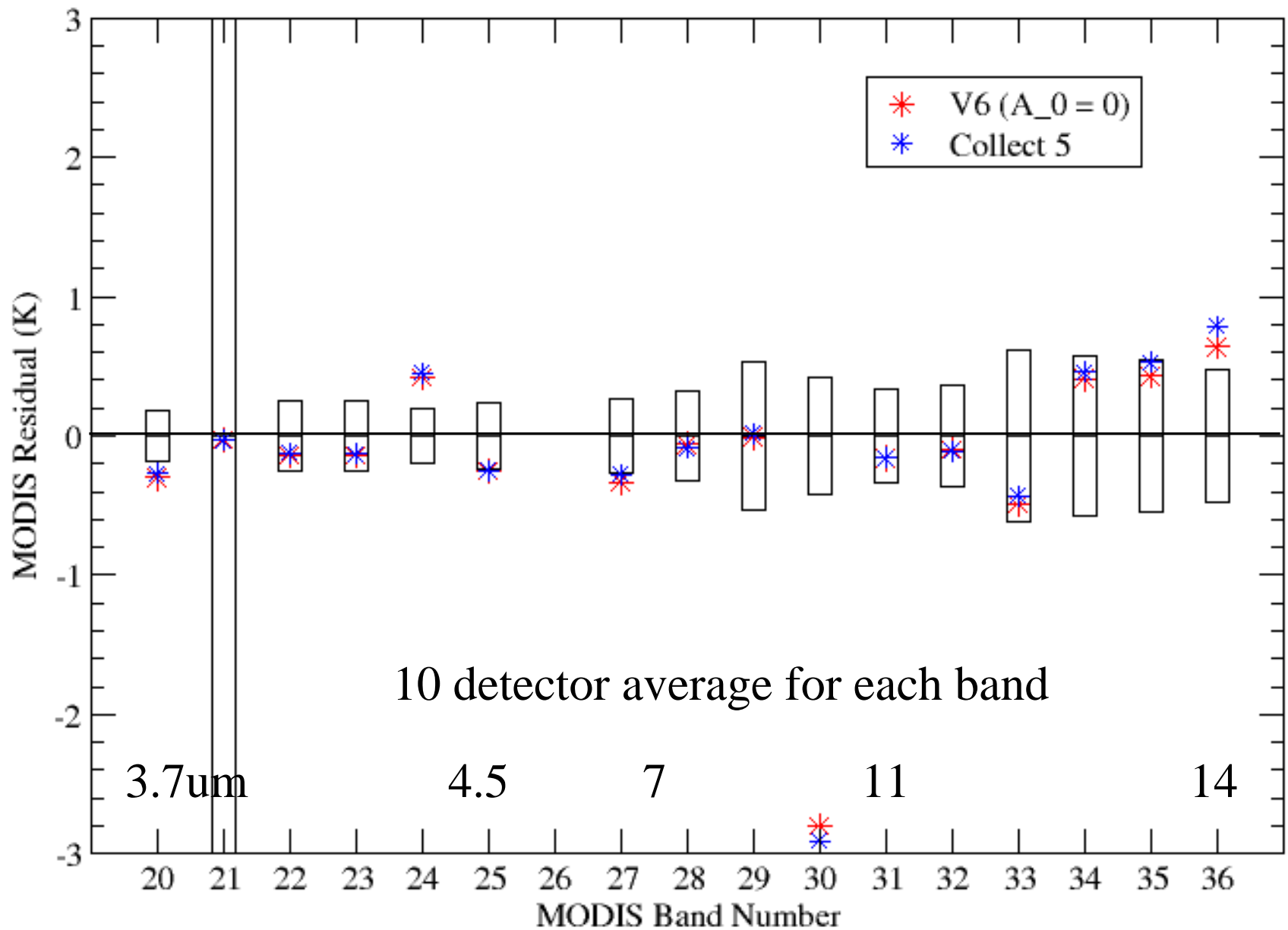
# Aqua MODIS TIR Band Accuracy Assessment

Oct 13, 2006; 1030 UTC; SHISF2N



# Aqua MODIS TIR Band Accuracy Assessment

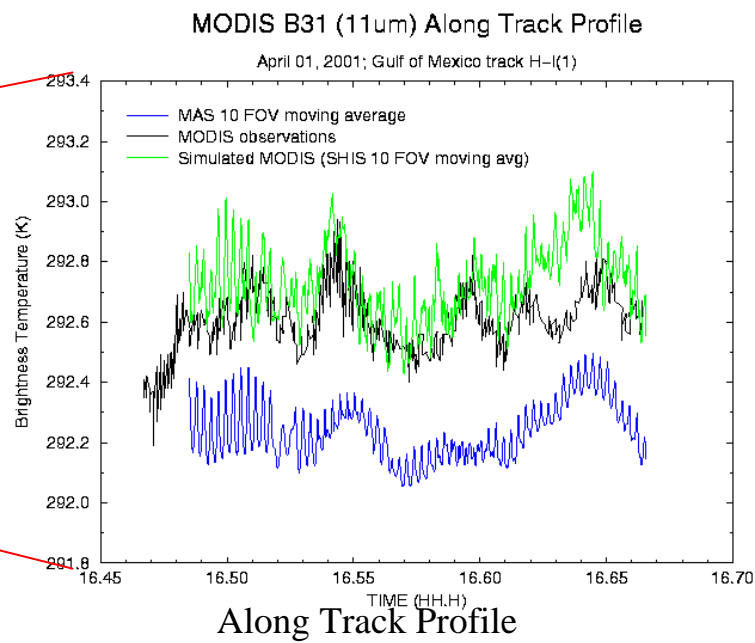
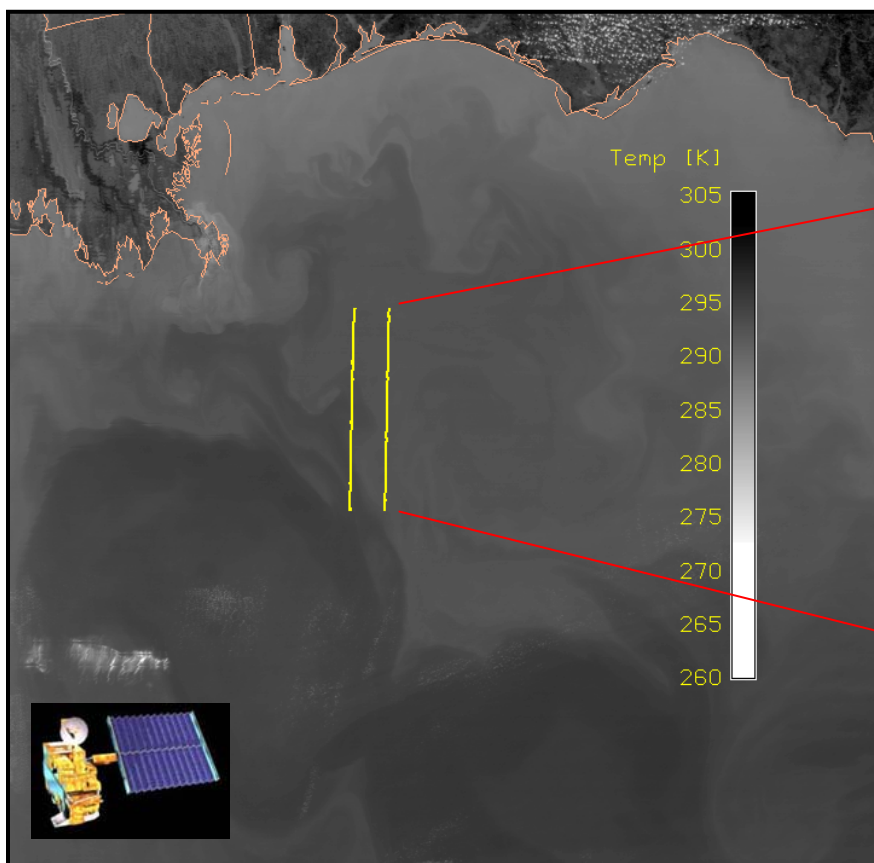
Nov 21, 2002; 1940 UTC; SHISF2





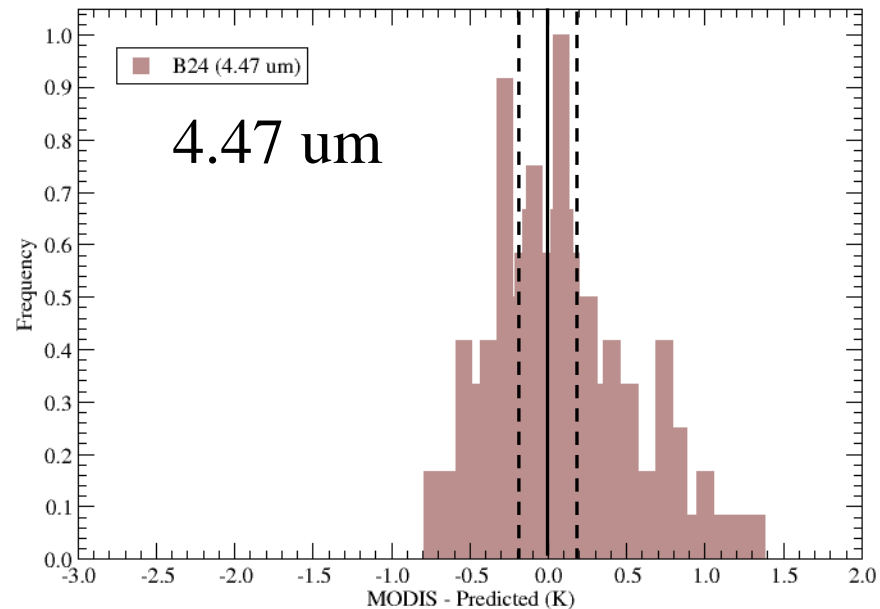
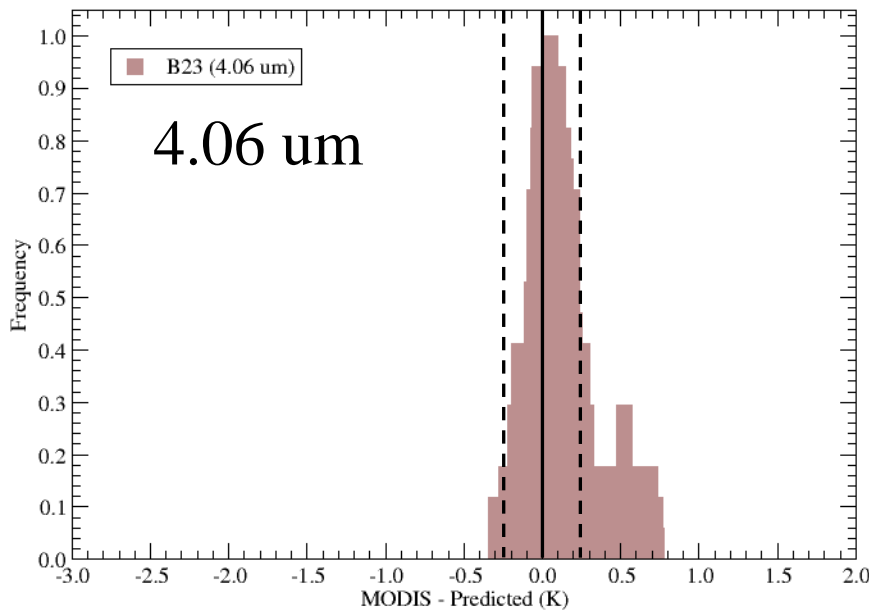
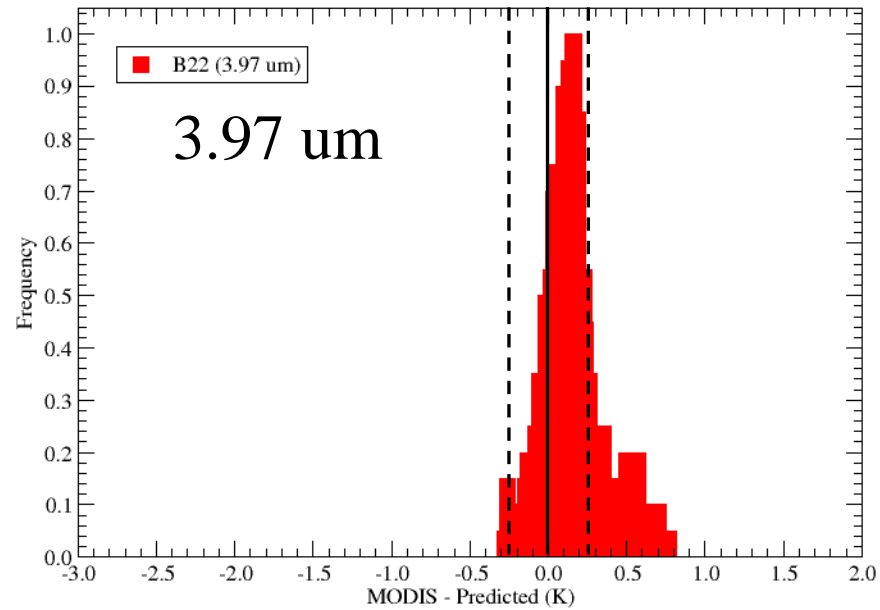
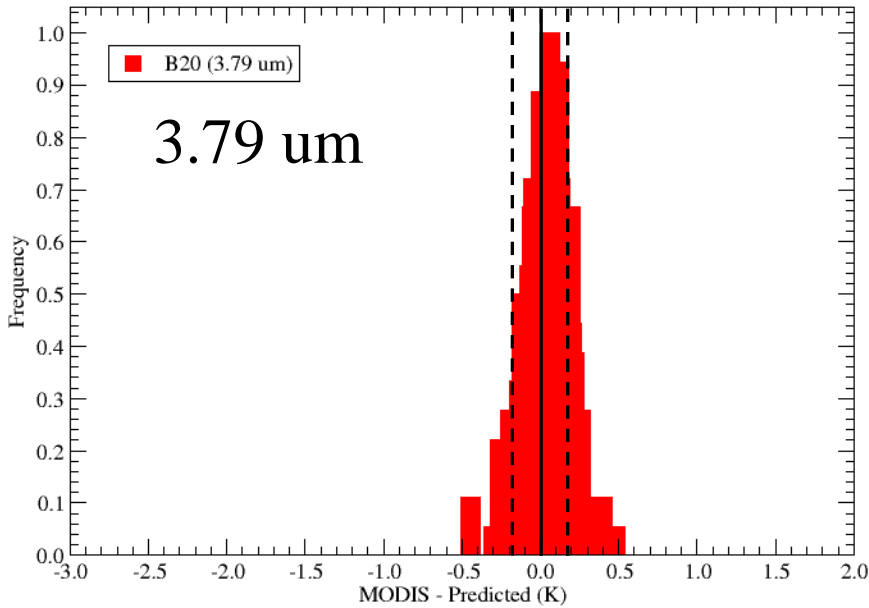
# *TX-2001 ER-2 Flights*

- Terra MODIS TIR Band Cal/Val
- Gulf of Mexico coastal evolution
- SHIS, MAS Cal Evaluation



# Terra MODIS L1B Assessment Histograms

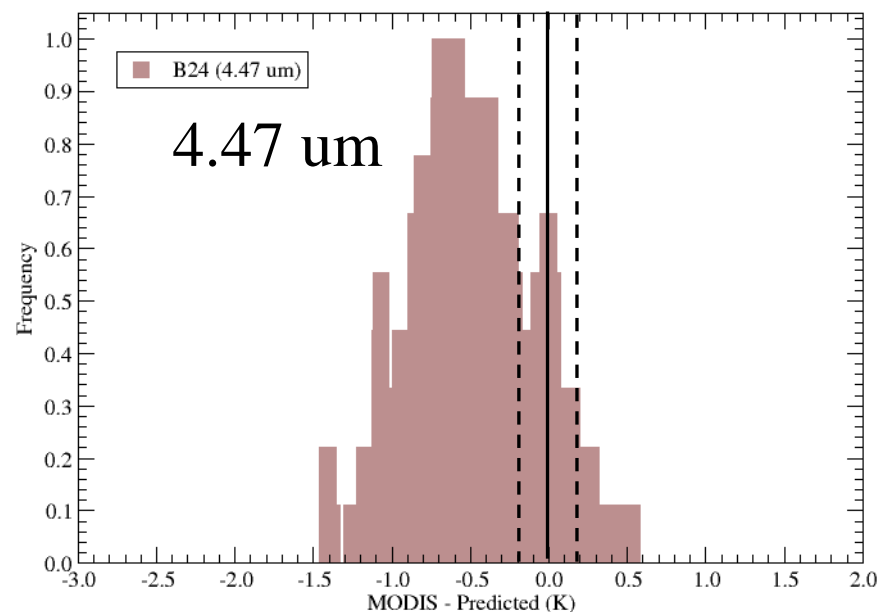
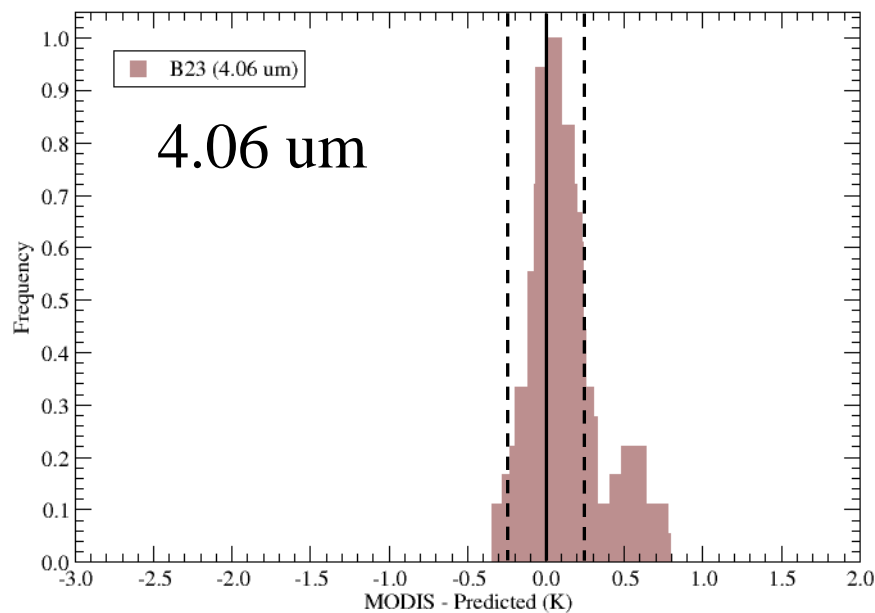
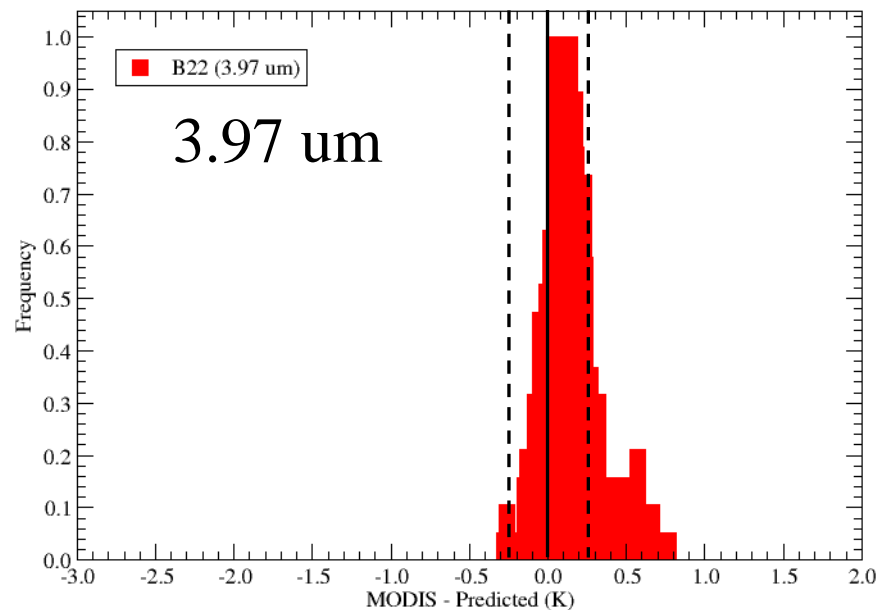
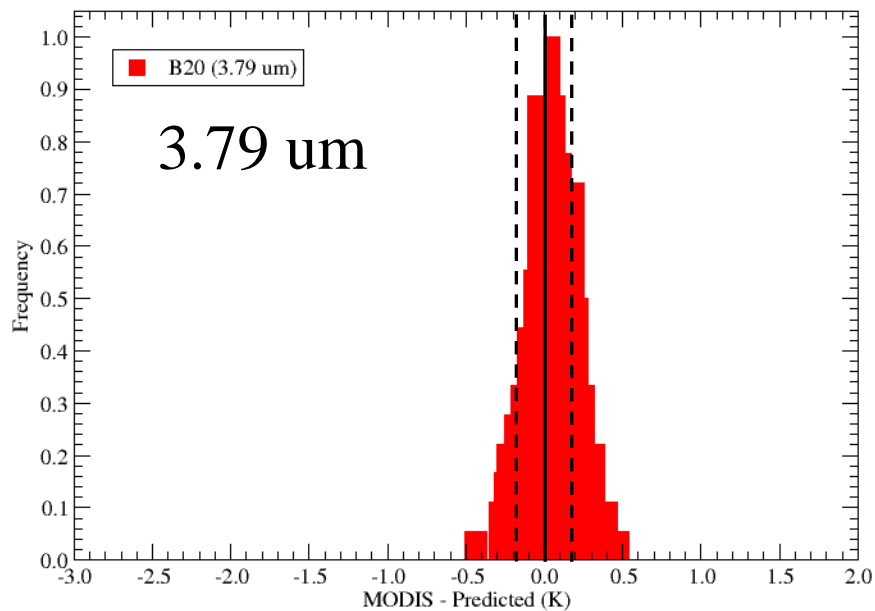
April 1, 2001; Track B-A(3); 462 Matchups; All Detectors





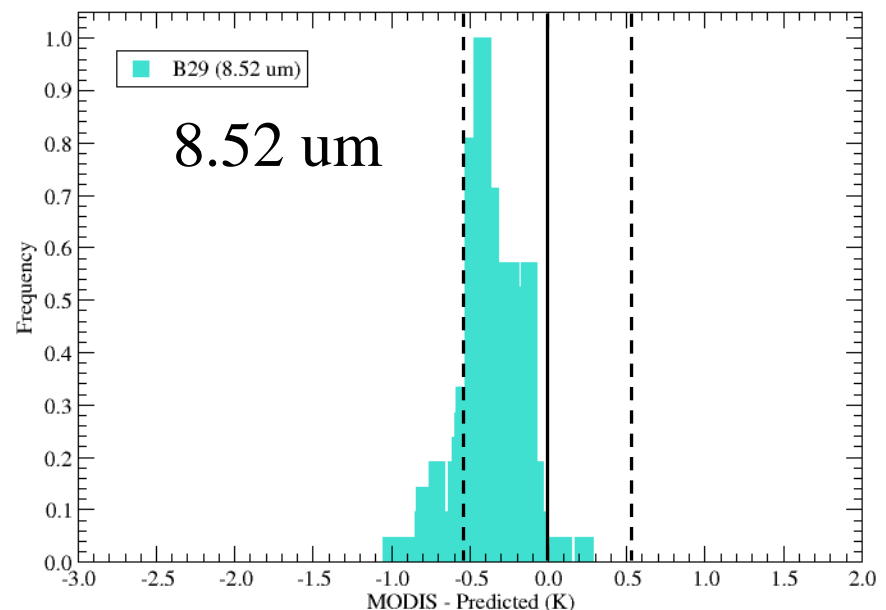
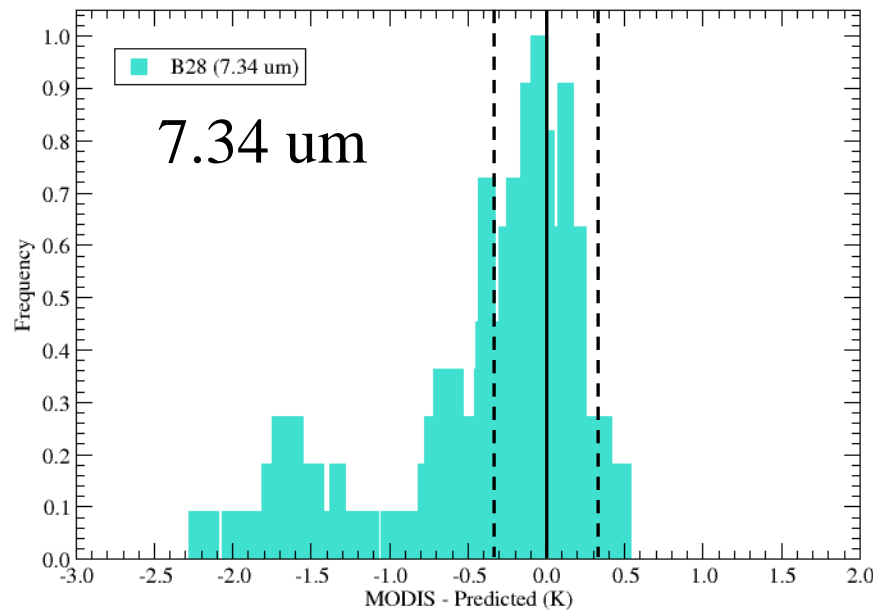
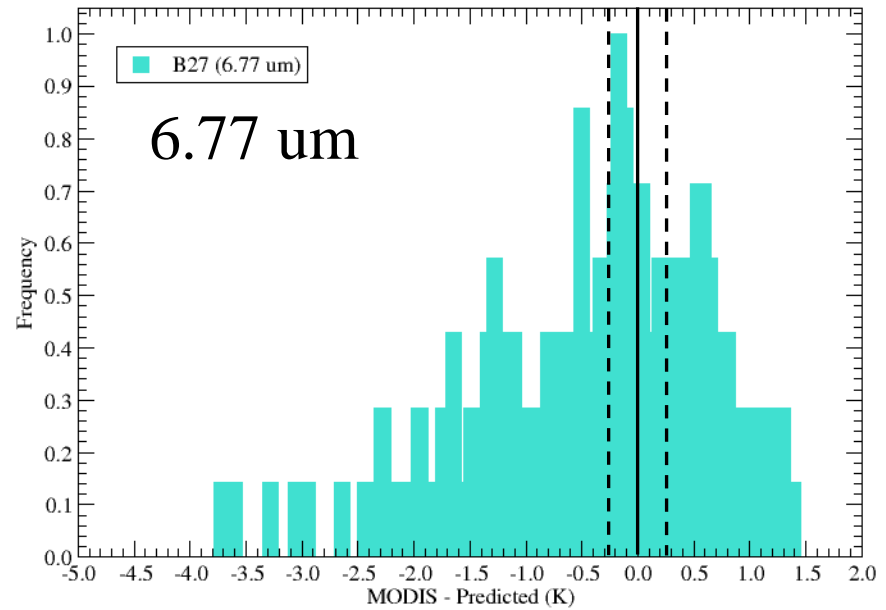
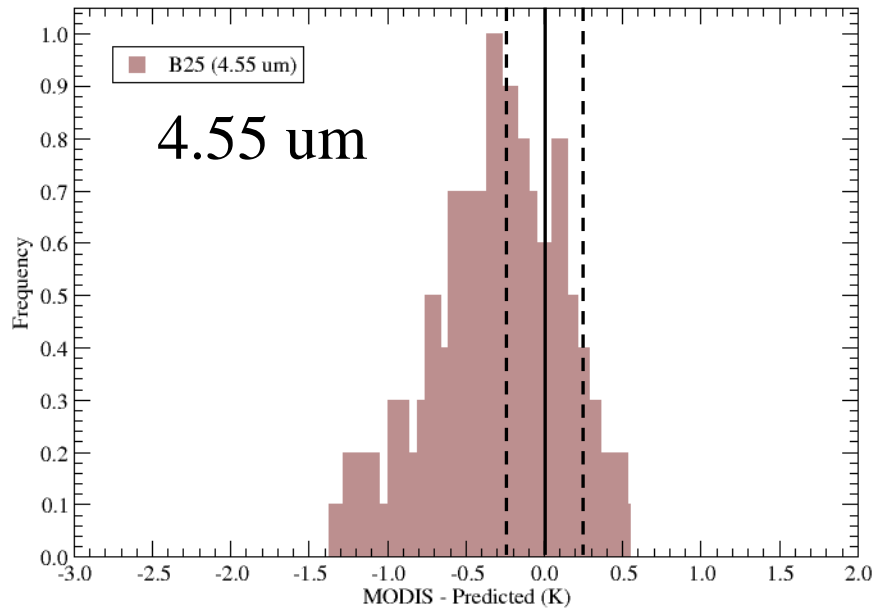
# Terra MODIS L1B Assessment Histograms

April 1, 2001; Track B-A(3); 462 Matchups; All Detectors; V6 Test



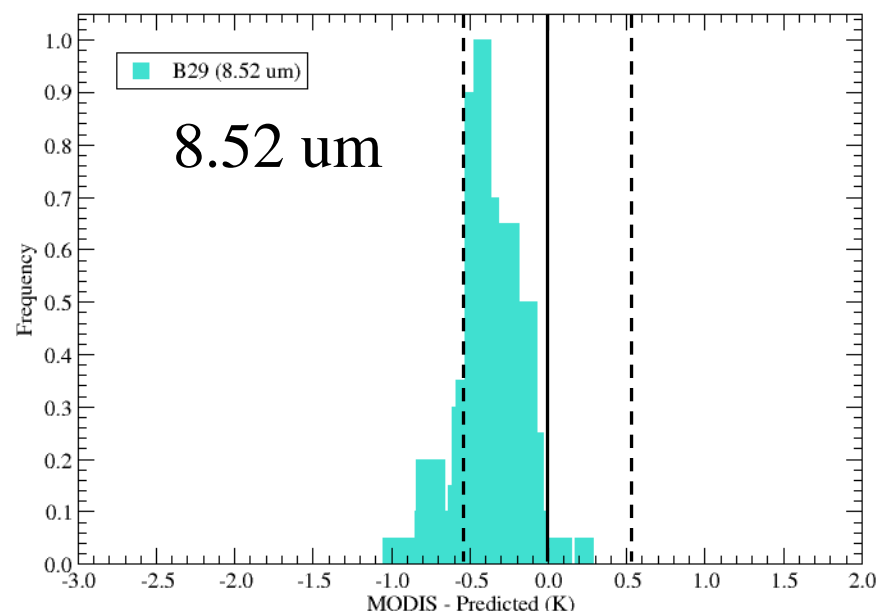
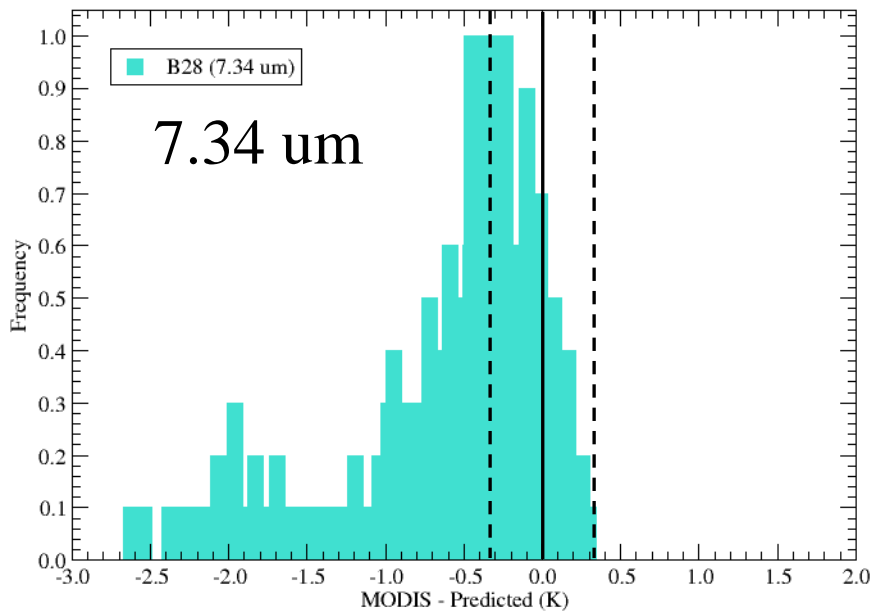
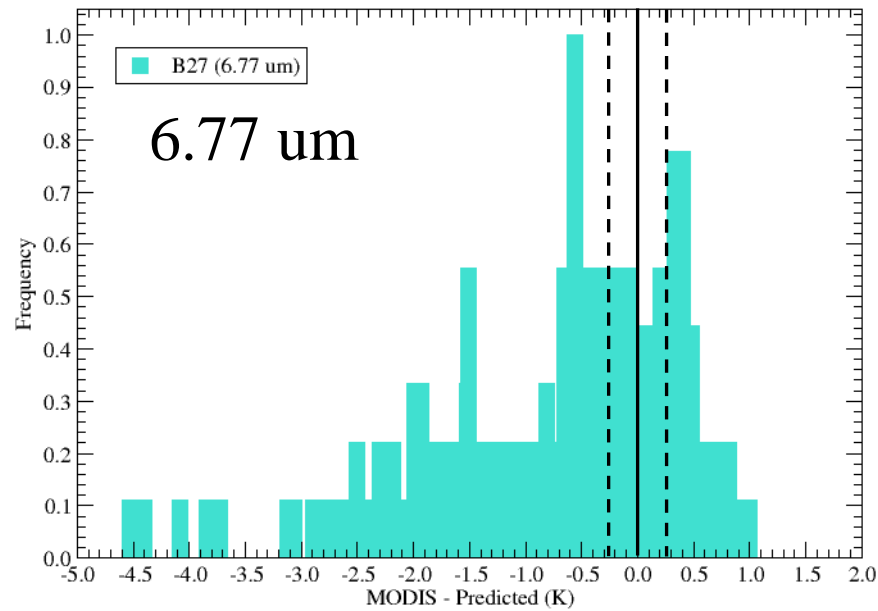
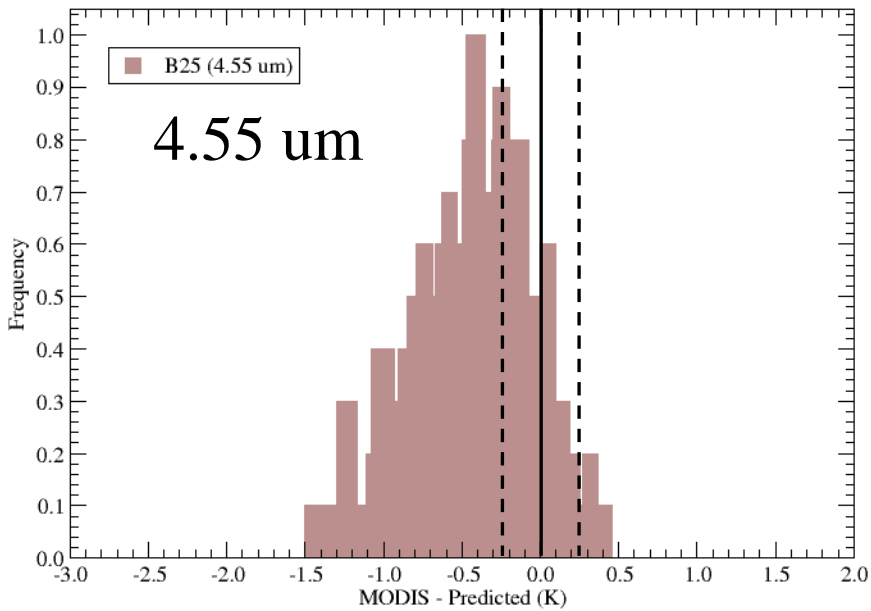
# Terra MODIS L1B Assessment Histograms

April 1, 2001; Track B-A(3); 462 Matchups; All Detectors



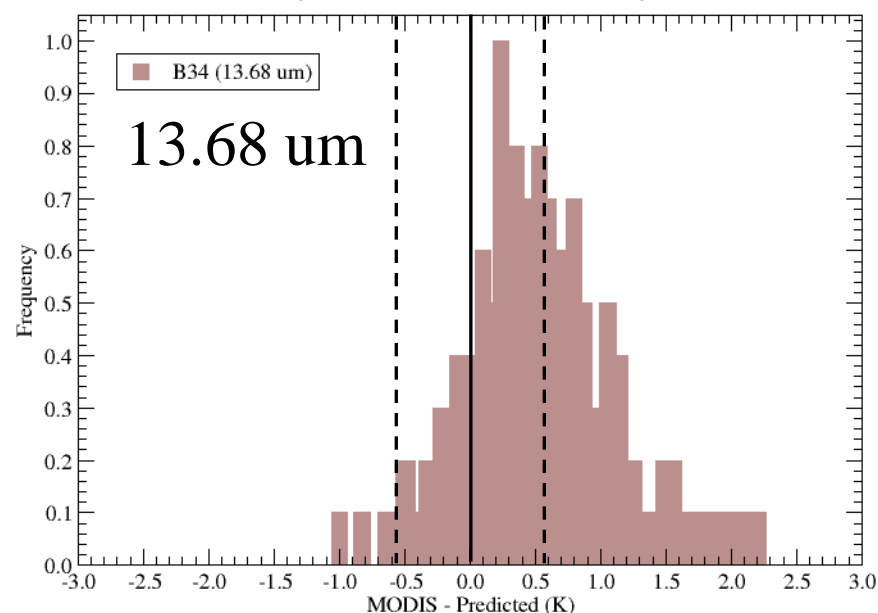
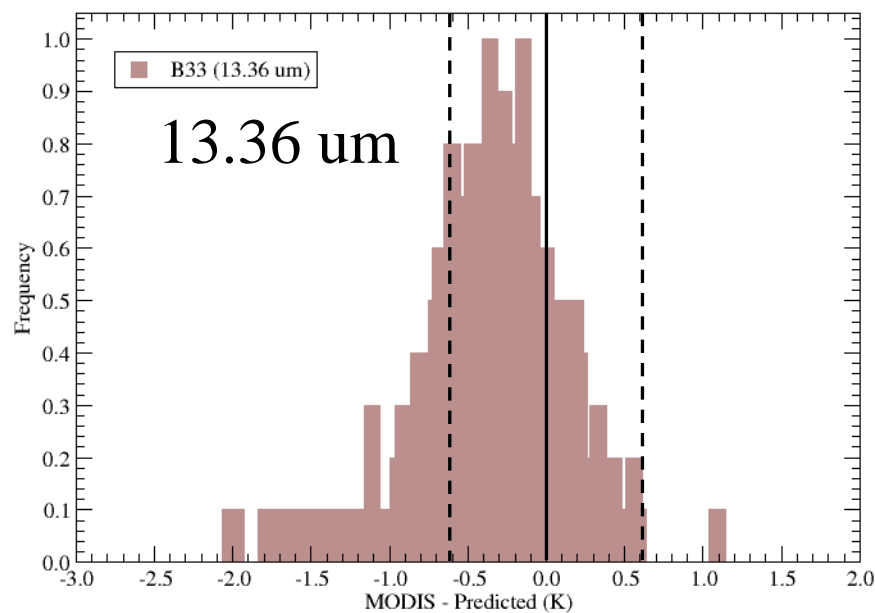
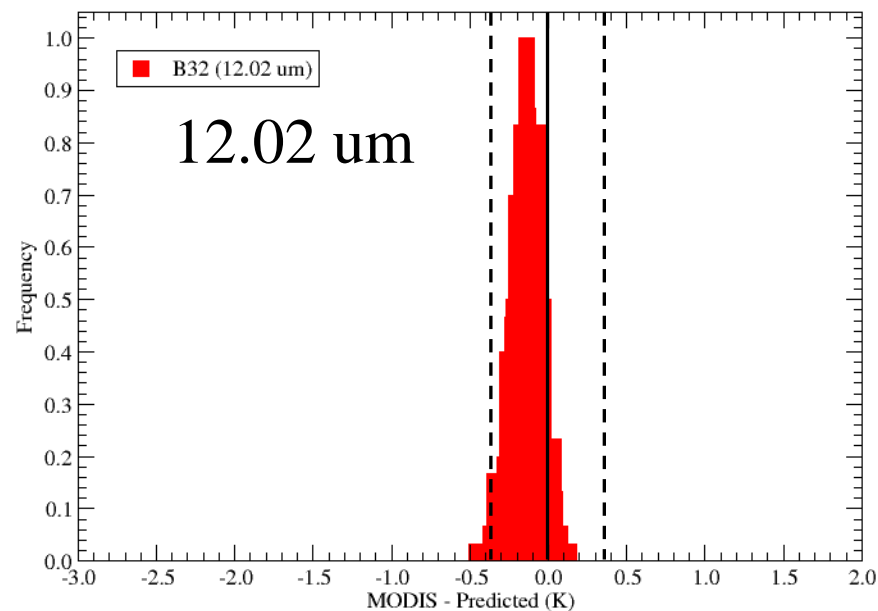
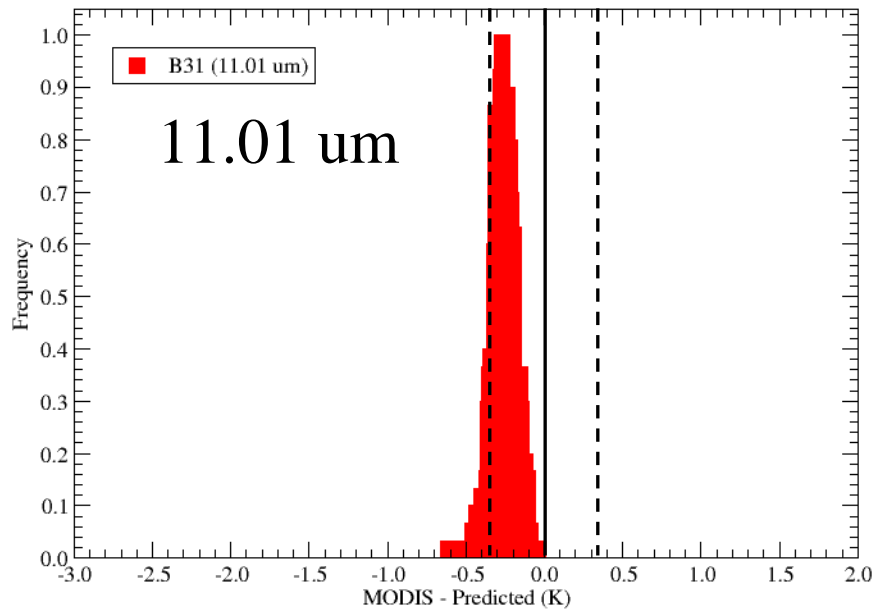
# Terra MODIS L1B Assessment Histograms

April 1, 2001; Track B-A(3); 462 Matchups; All Detectors; V6 Test



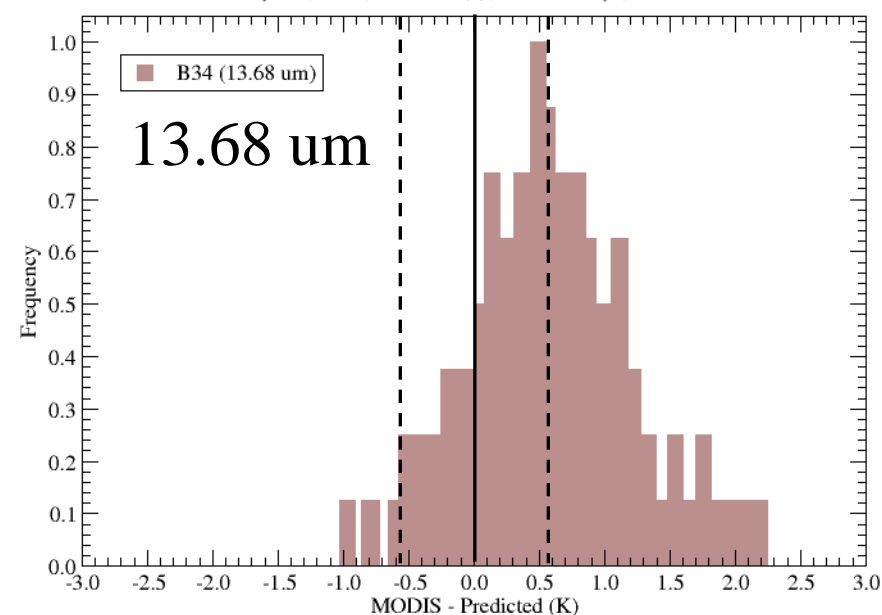
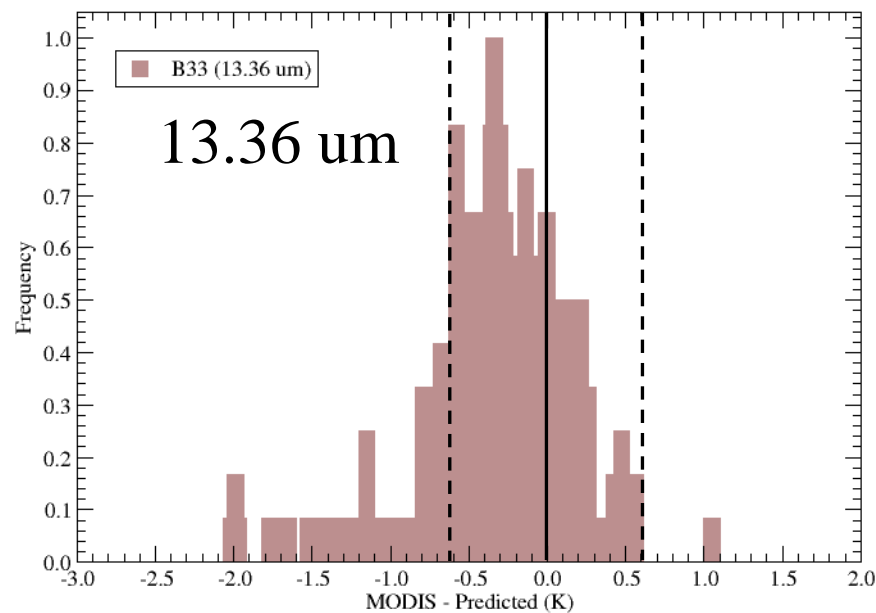
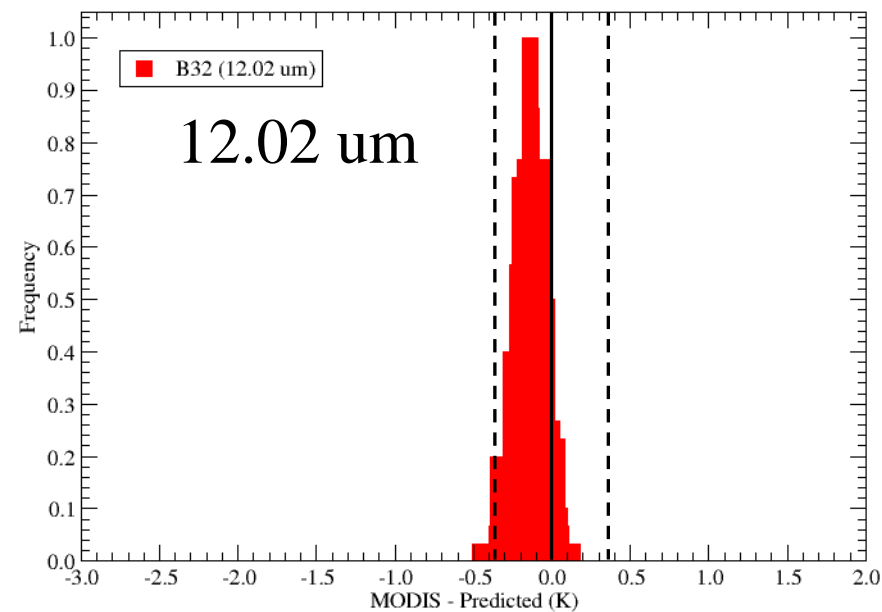
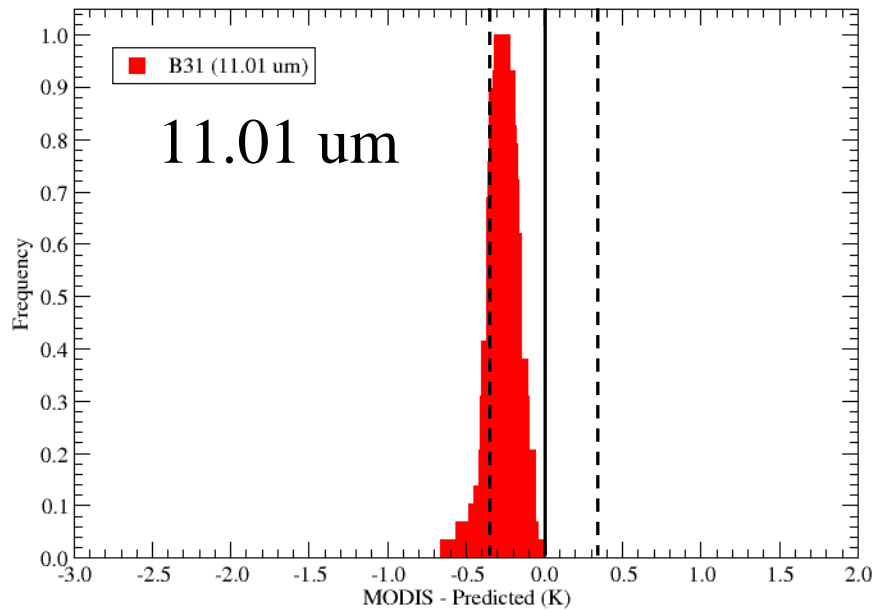
# Terra MODIS L1B Assessment Histograms

April 1, 2001; Track B-A(3); 462 Matchups; All Detectors



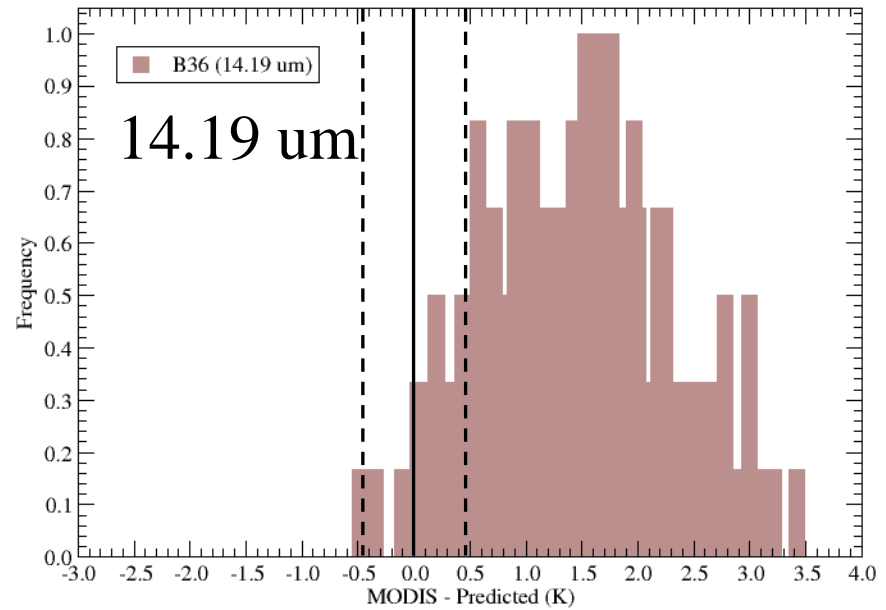
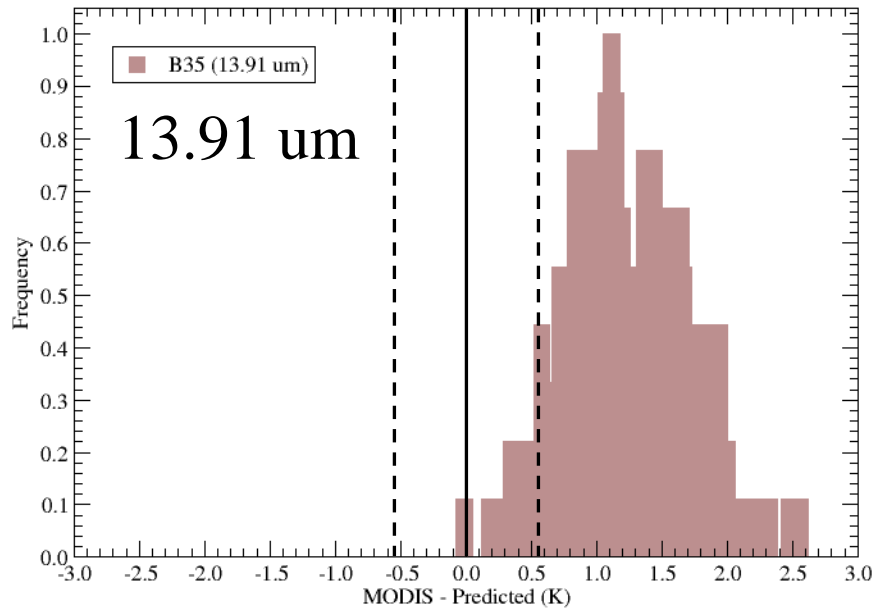
# Terra MODIS L1B Assessment Histograms

April 1, 2001; Track B-A(3); 462 Matchups; All Detectors; V6 Test



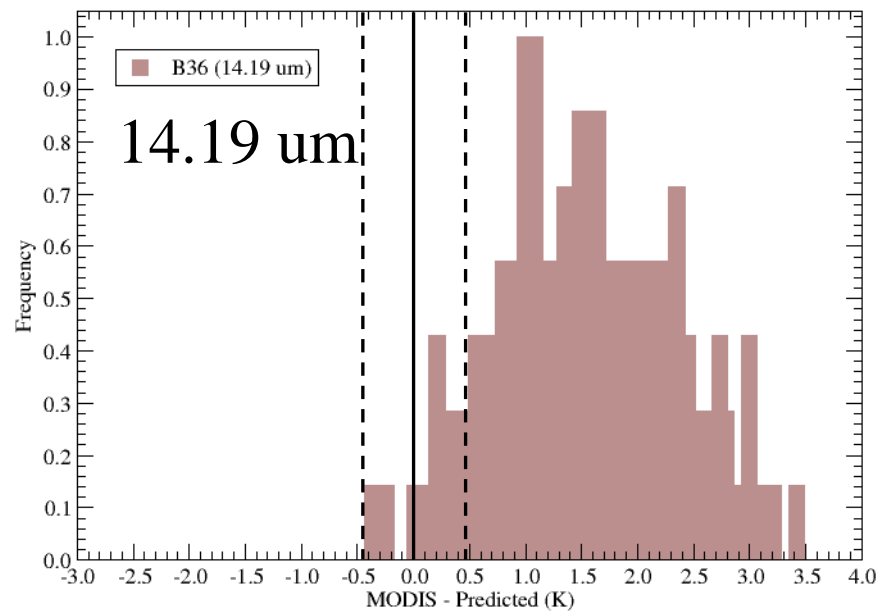
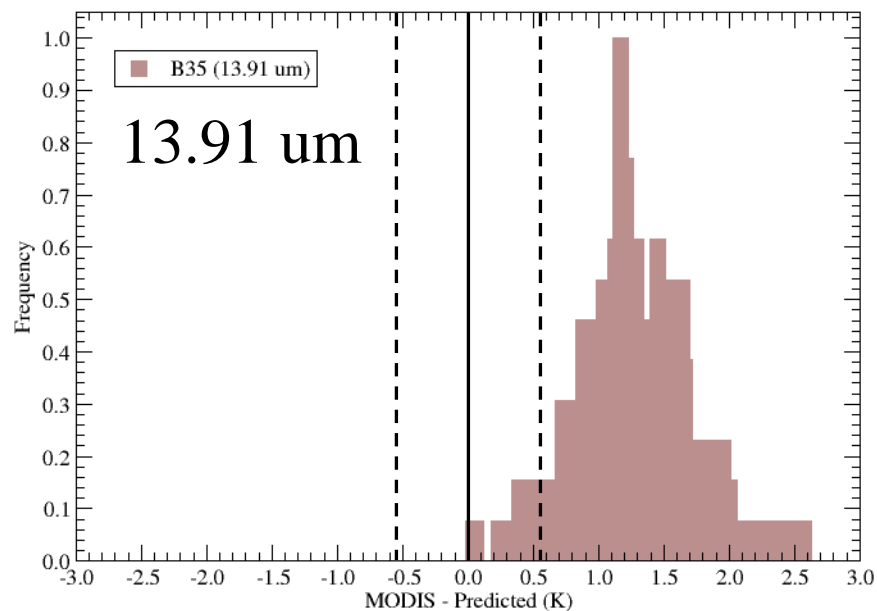
# Terra MODIS L1B Assessment Histograms

April 1, 2001; Track B-A(3); 462 Matchups; All Detectors



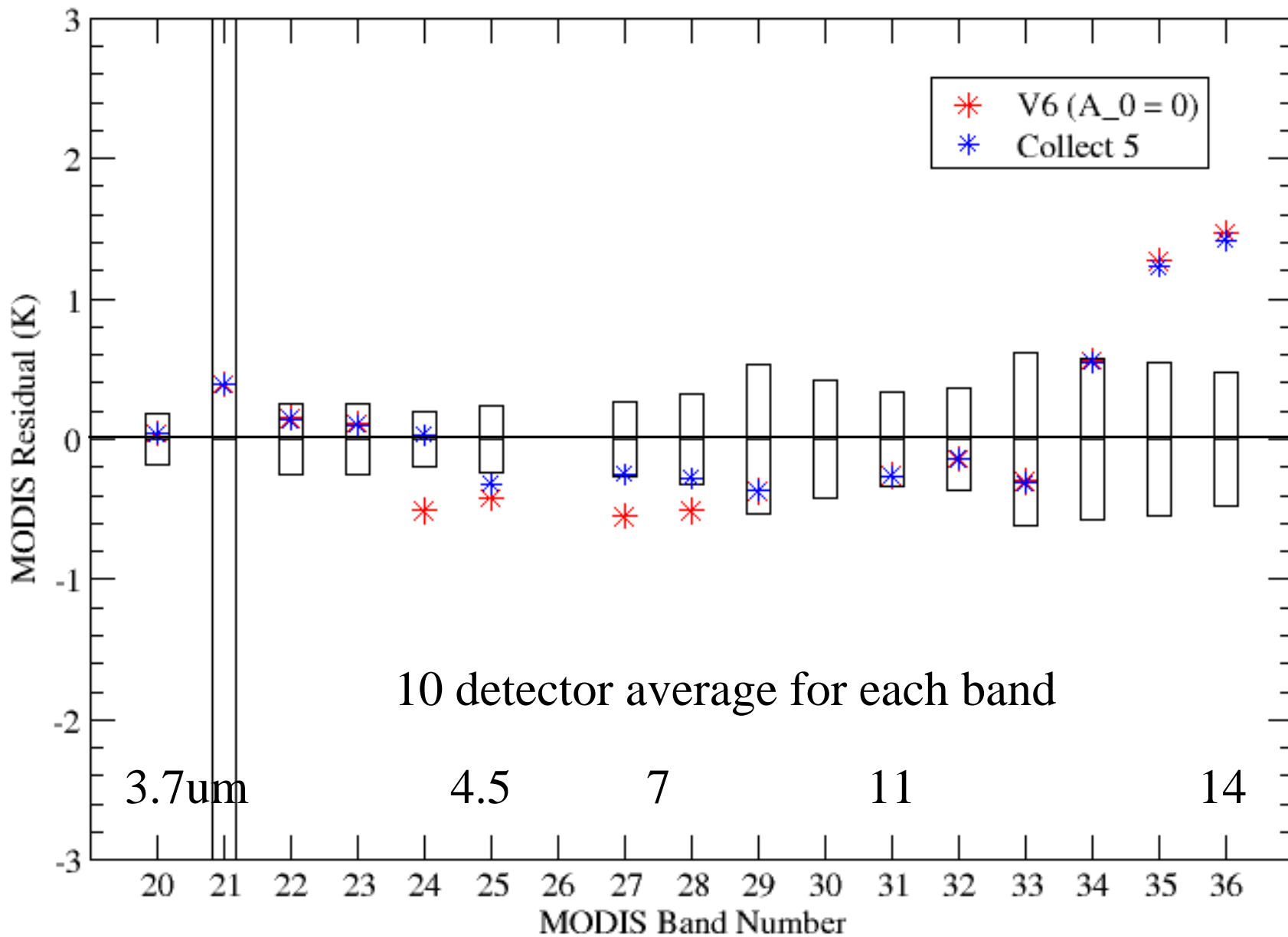
# Terra MODIS L1B Assessment Histograms

April 1, 2001; Track B-A(3); 462 Matchups; All Detectors; V6 Test



# Terra MODIS TIR Band Accuracy Assessment

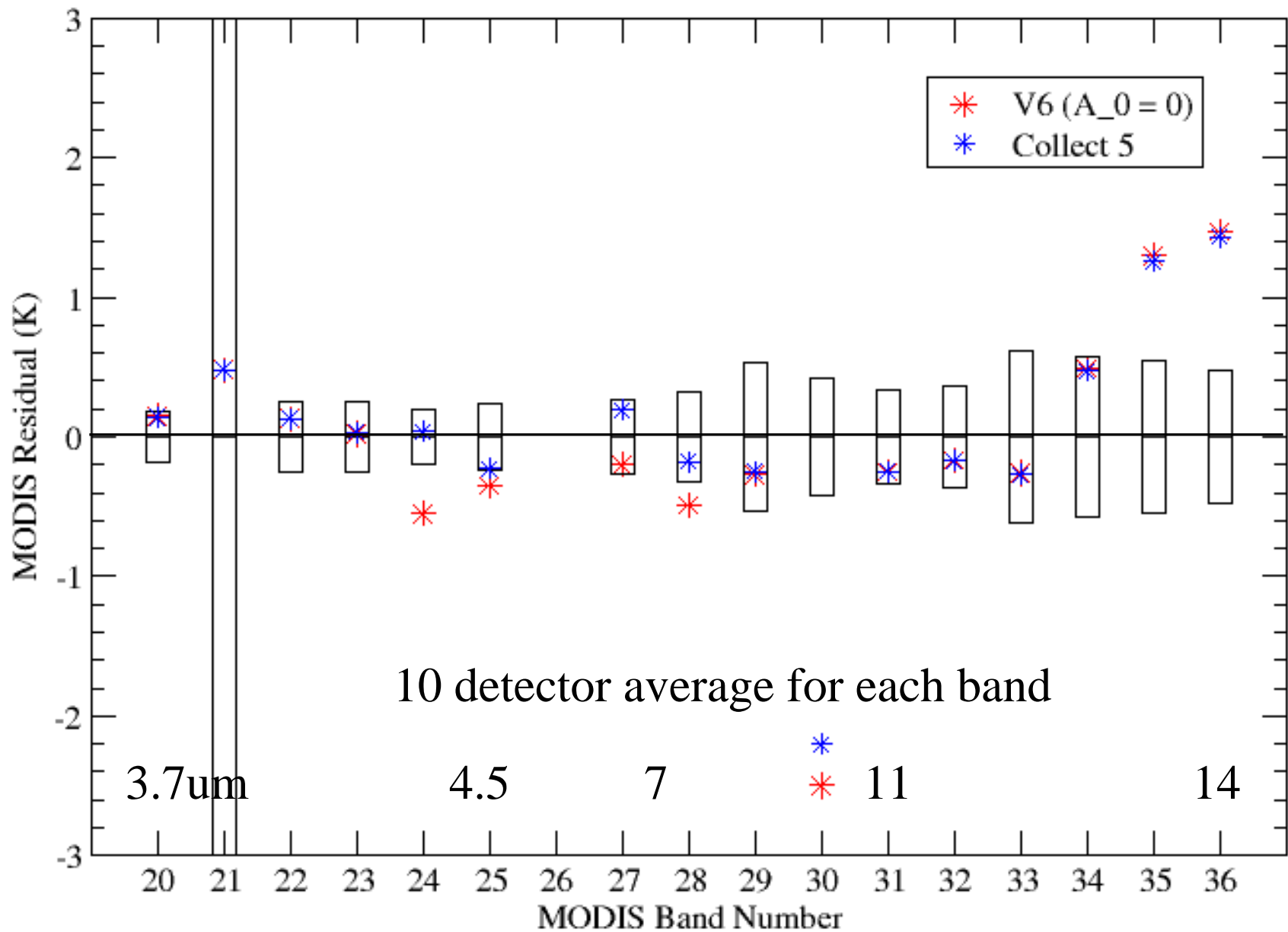
April 1, 2001; 1635 UTC; SHISFRN





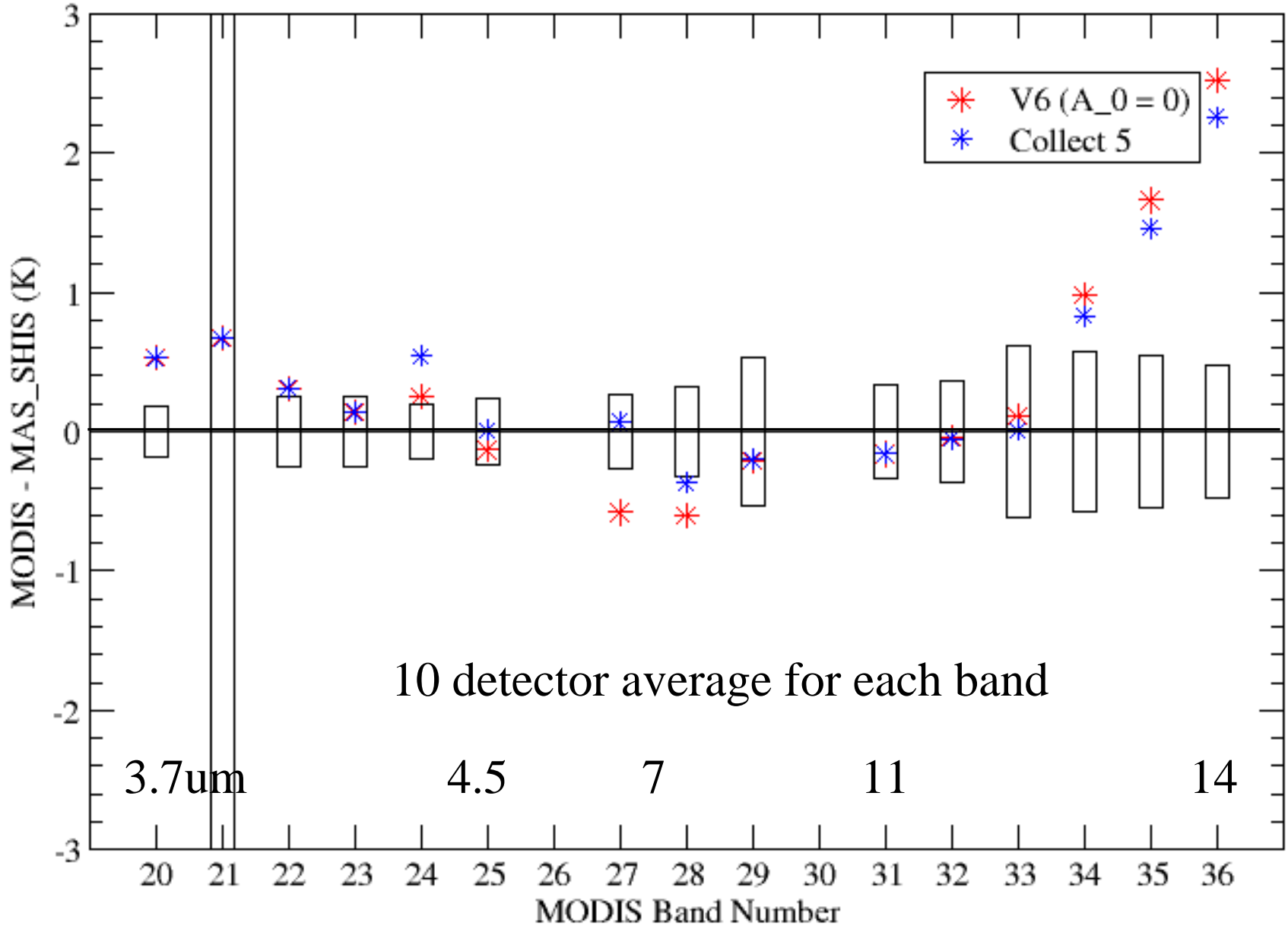
# Terra MODIS TIR Band Accuracy Assessment

March 26, 2001; 1710 UTC; SHISFRN



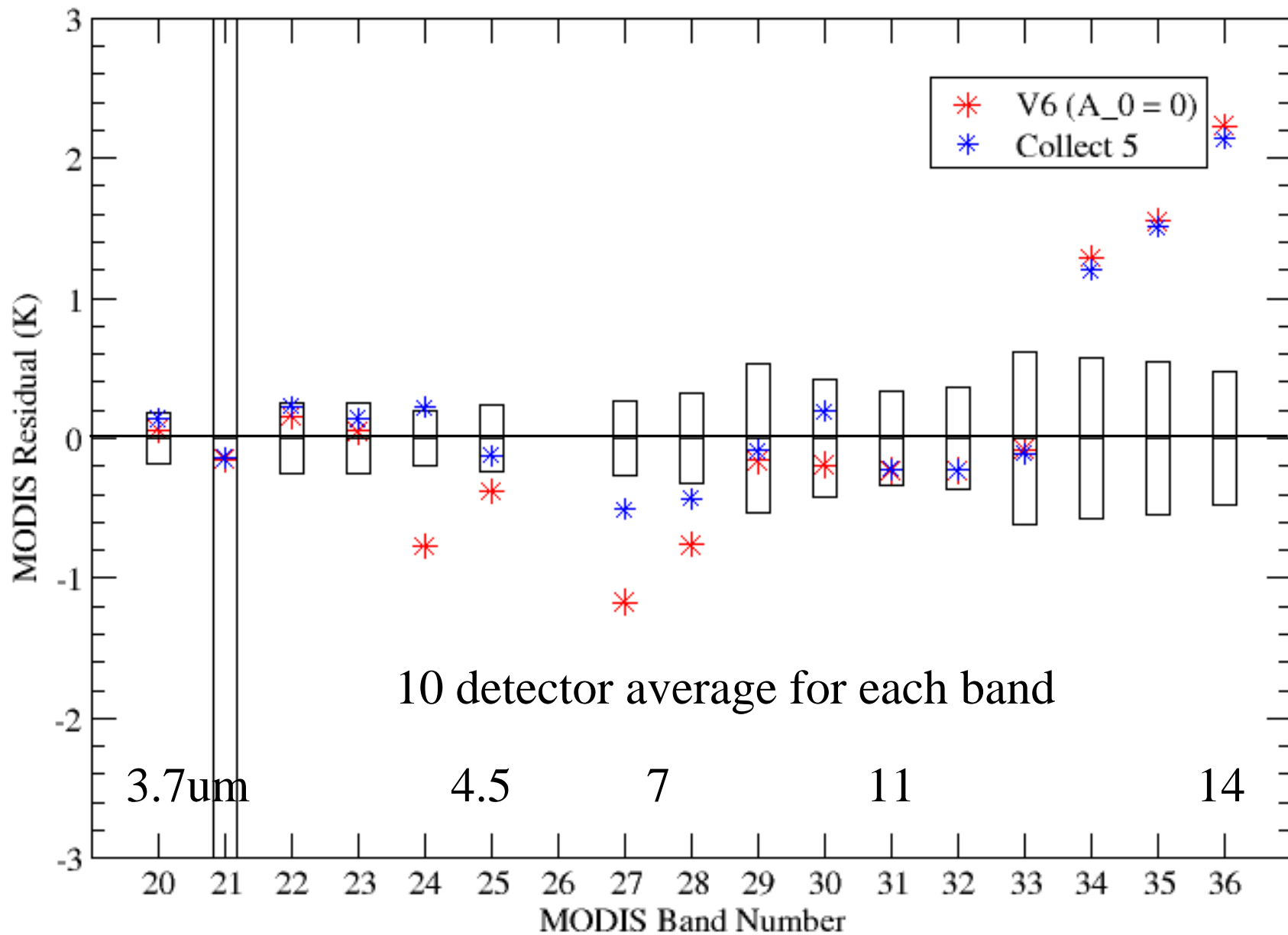
# Terra MODIS L1B Accuracy Assessment

Sept 11, 2000; 0940 UTC; SHISFRN



# Terra MODIS TIR Band Accuracy Assessment

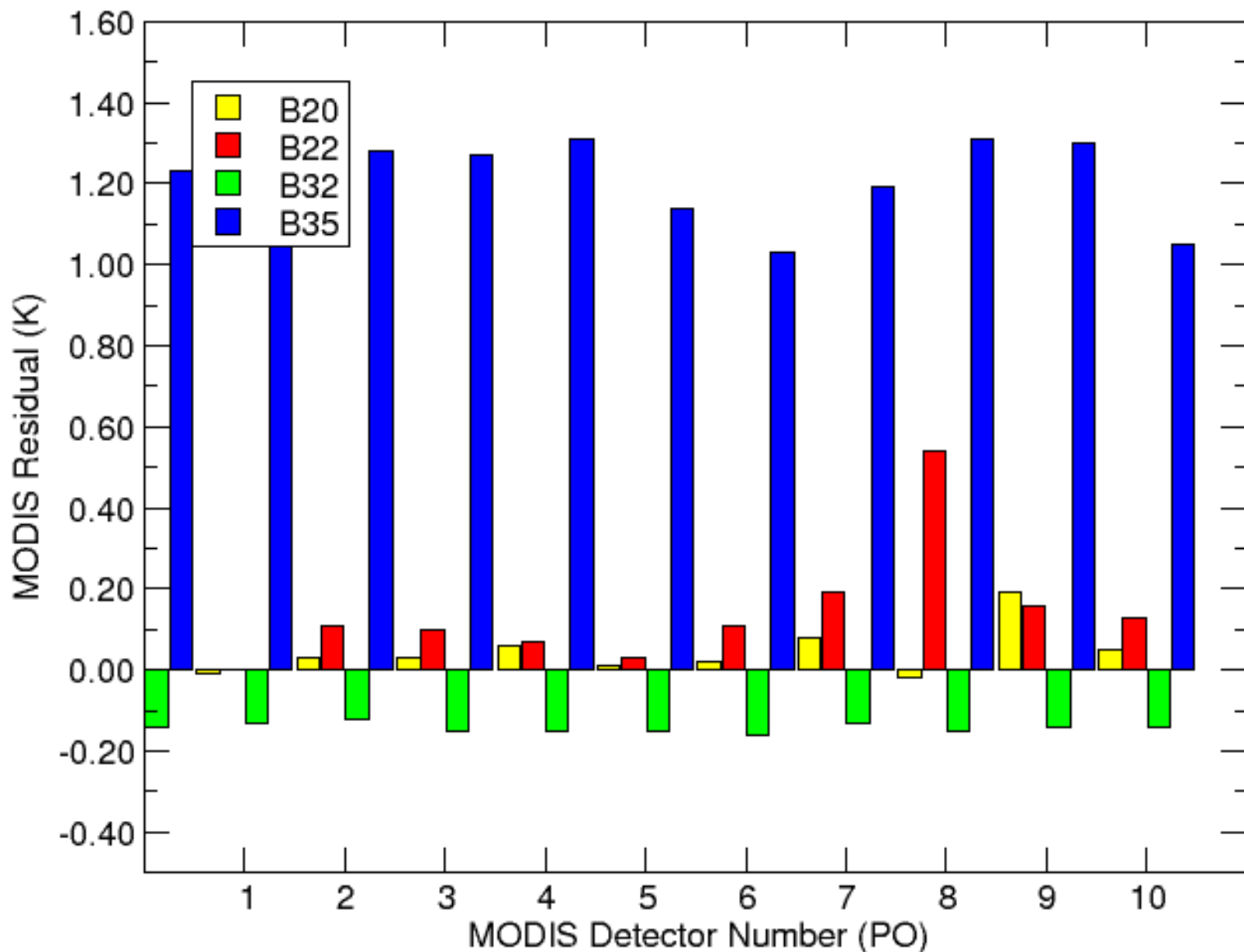
April 9, 2004; 0600 UTC; SHISF2



Any impact on detector striping?

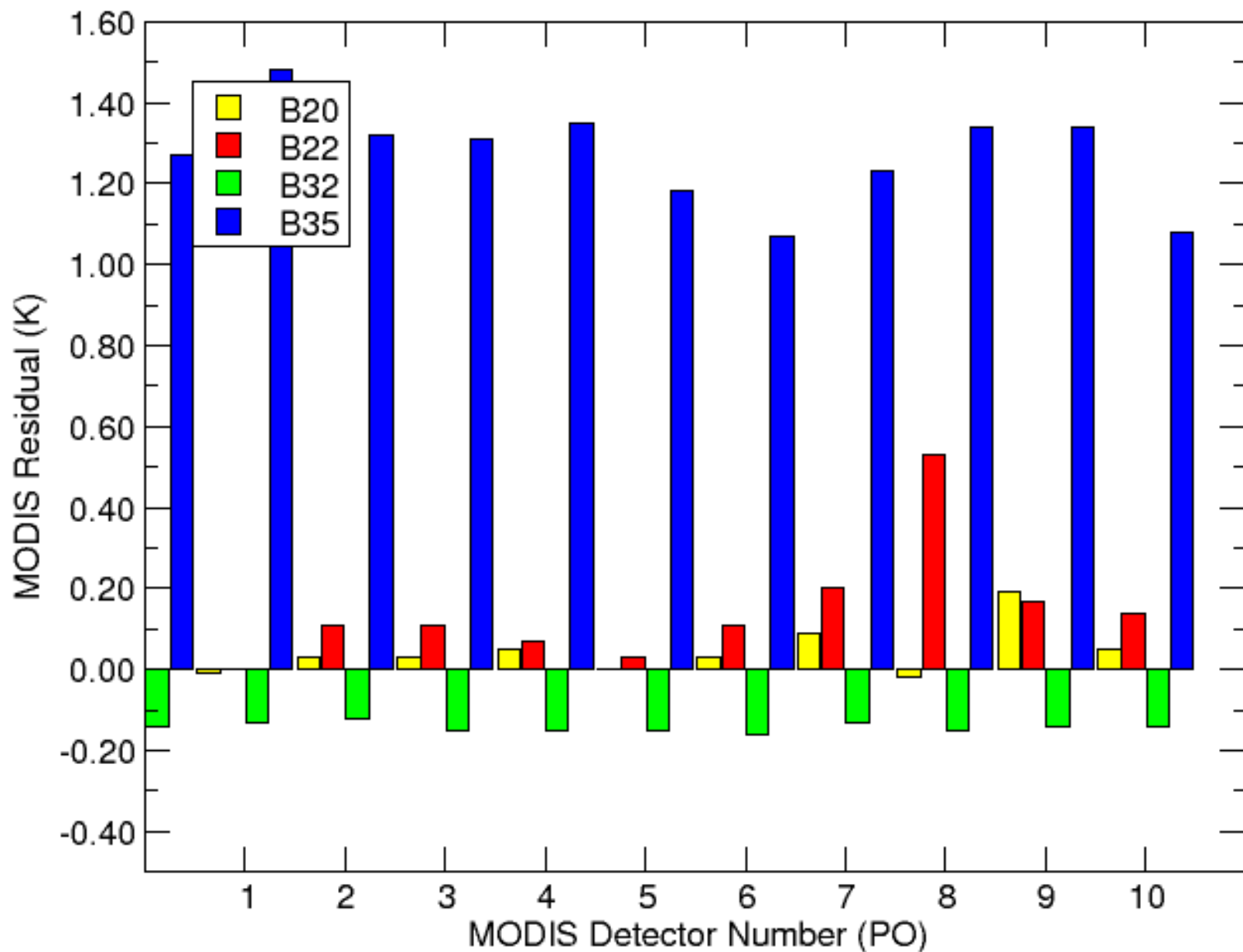
# Terra MODIS Detector by Detector Residual

April 1, 2001; 1635 UTC; V5.0.6



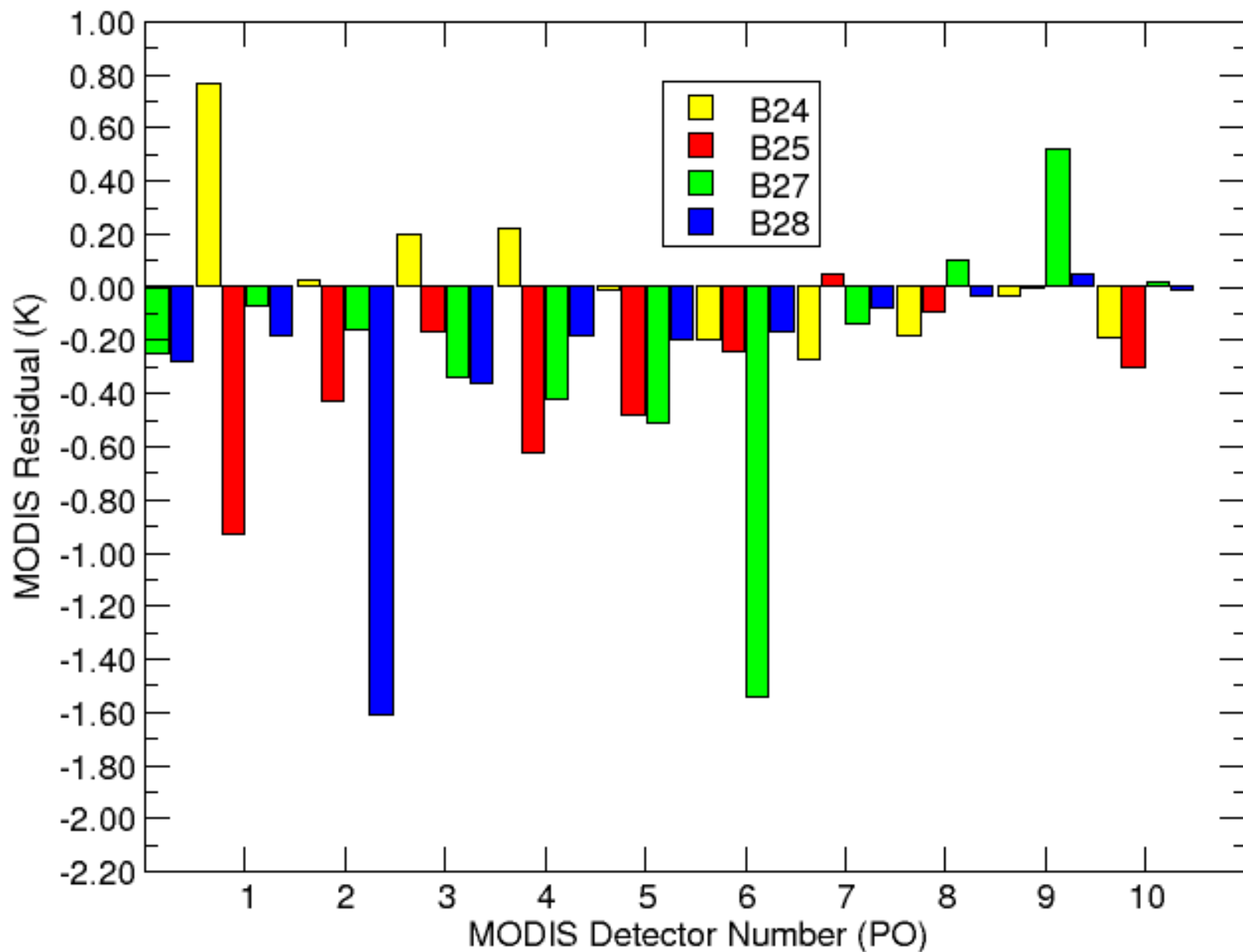
# Terra MODIS Detector by Detector Residual

April 1, 2001; 1635 UTC; V6 Test



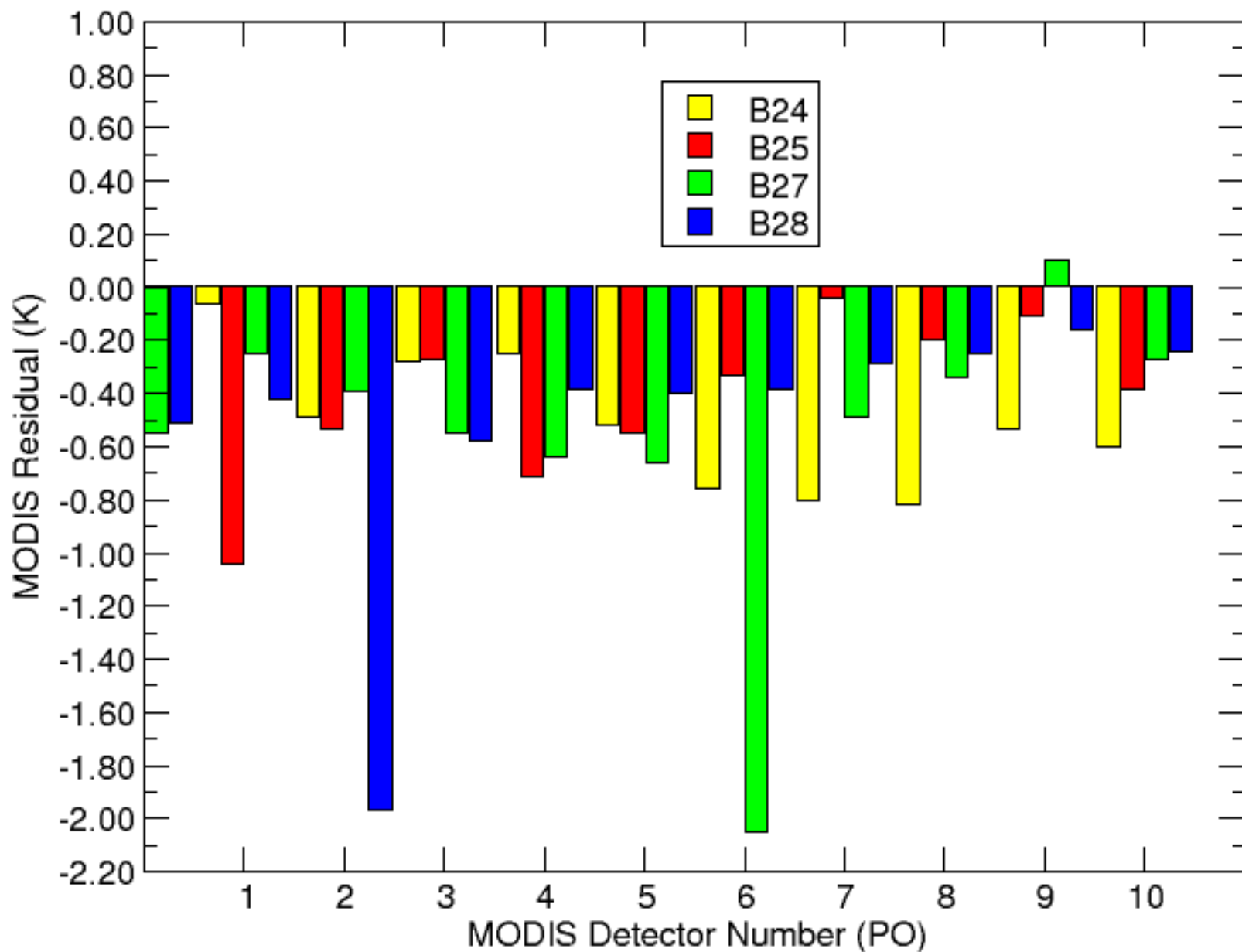
# Terra MODIS Detector by Detector Residual

April 1, 2001; 1635 UTC; V5.0.6



# Terra MODIS Detector by Detector Residual

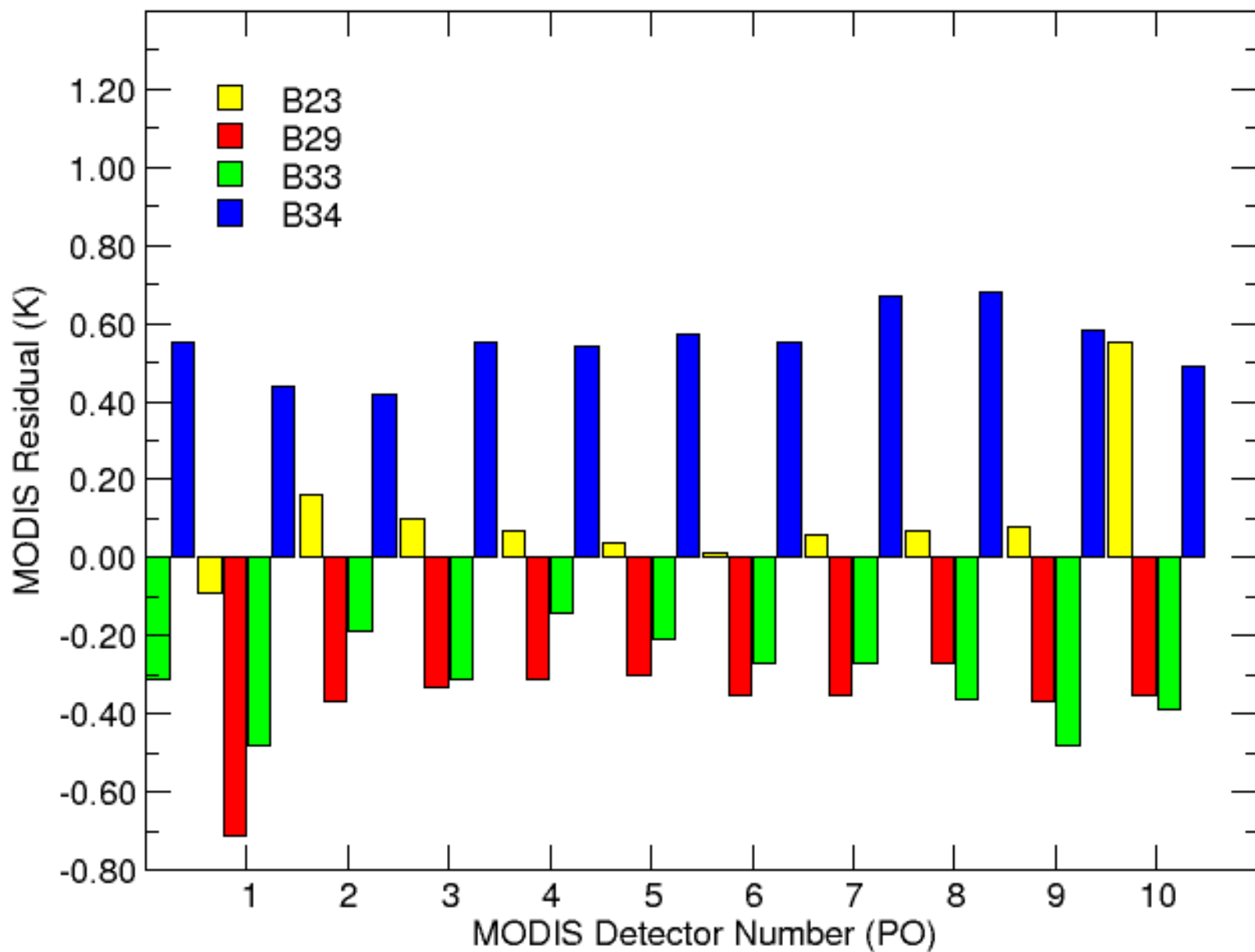
April 1, 2001; 1635 UTC; V6 Test





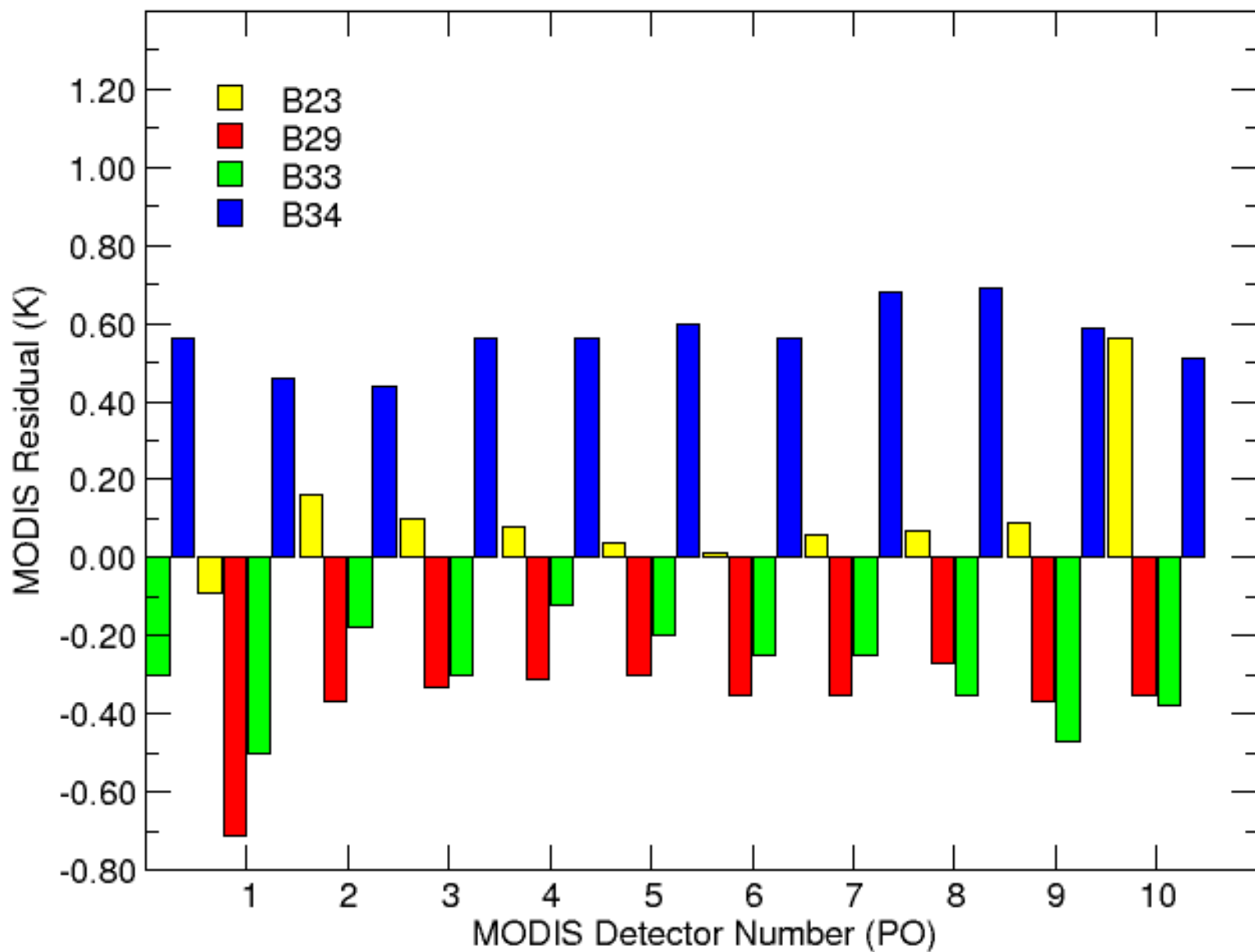
# Terra MODIS Detector by Detector Residual

April 1, 2001; 1635 UTC; V5.0.6



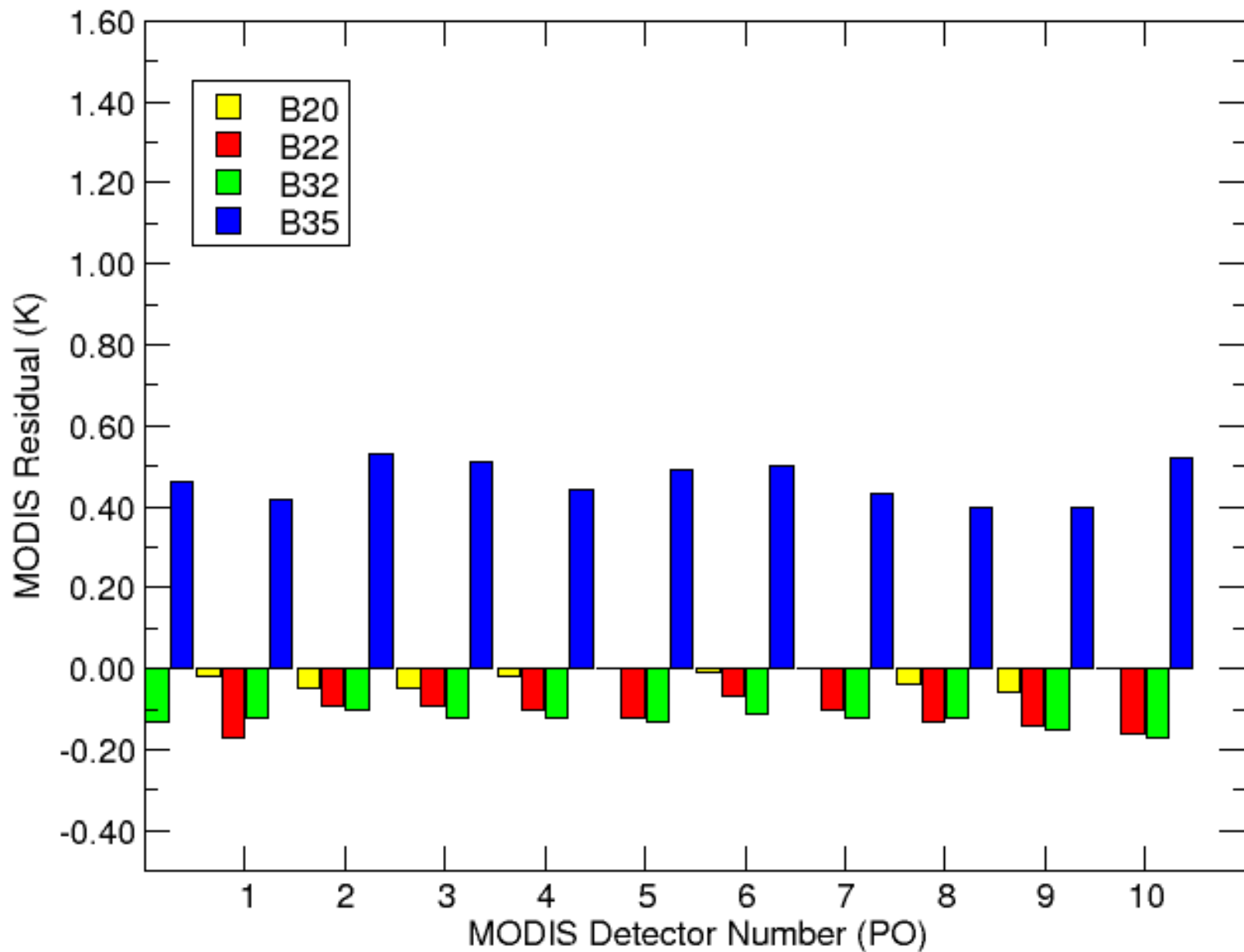
# Terra MODIS Detector by Detector Residual

April 1, 2001; 1635 UTC; V6 Test



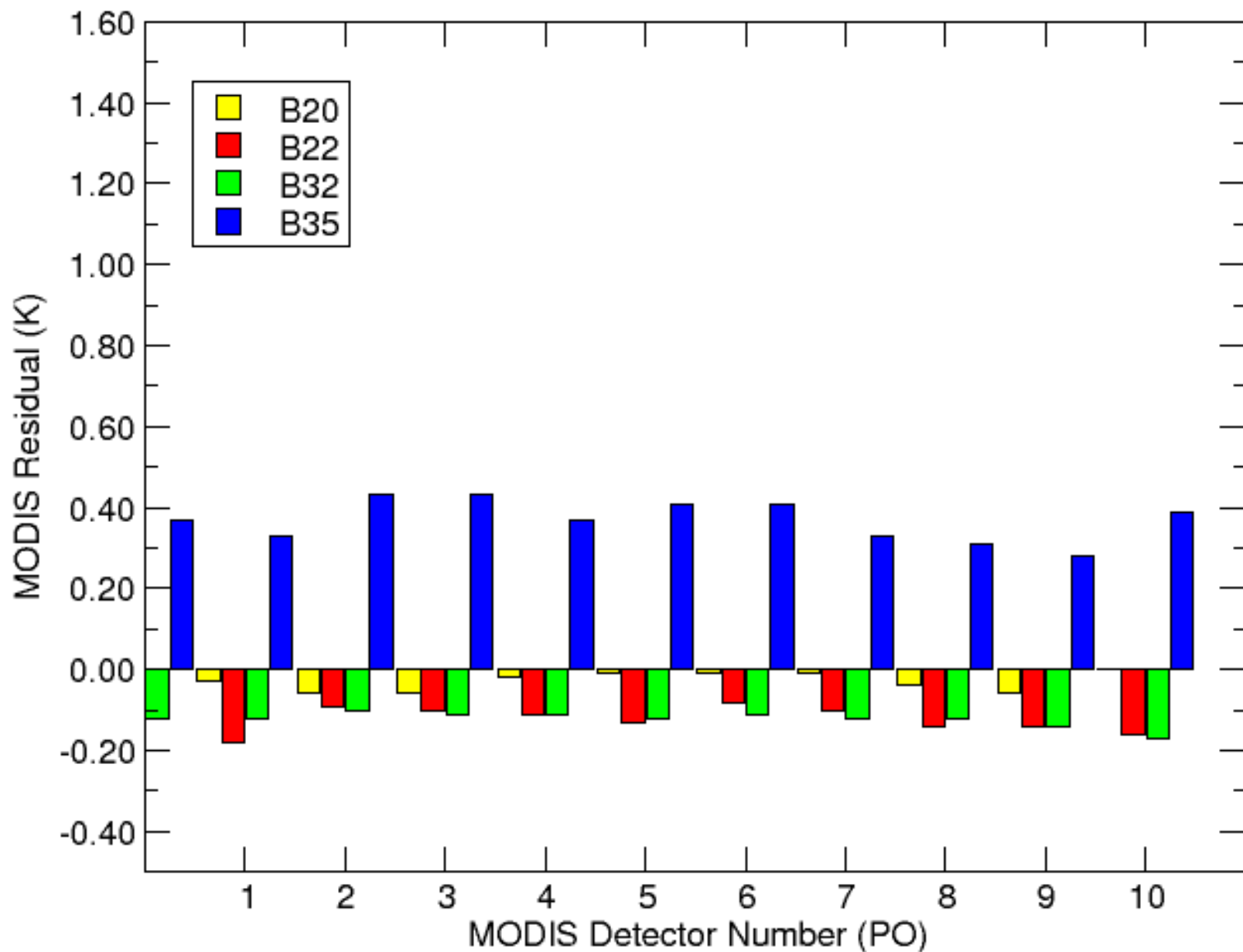
# Aqua MODIS Detector by Detector Residual

Oct 13, 2006; 1030 UTC; V5.0.7



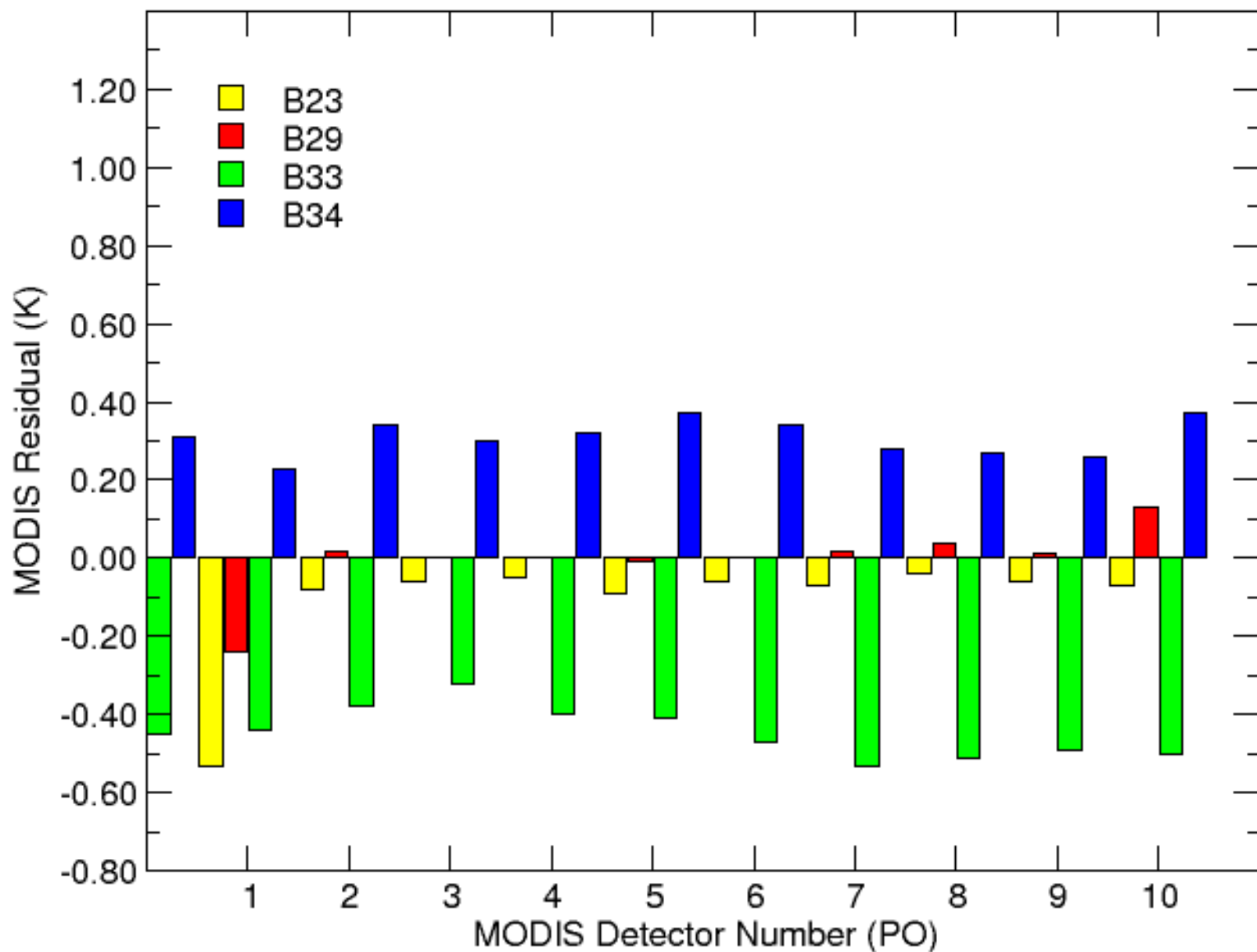
# Aqua MODIS Detector by Detector Residual

Oct 13, 2006; 1030 UTC; V6 Test



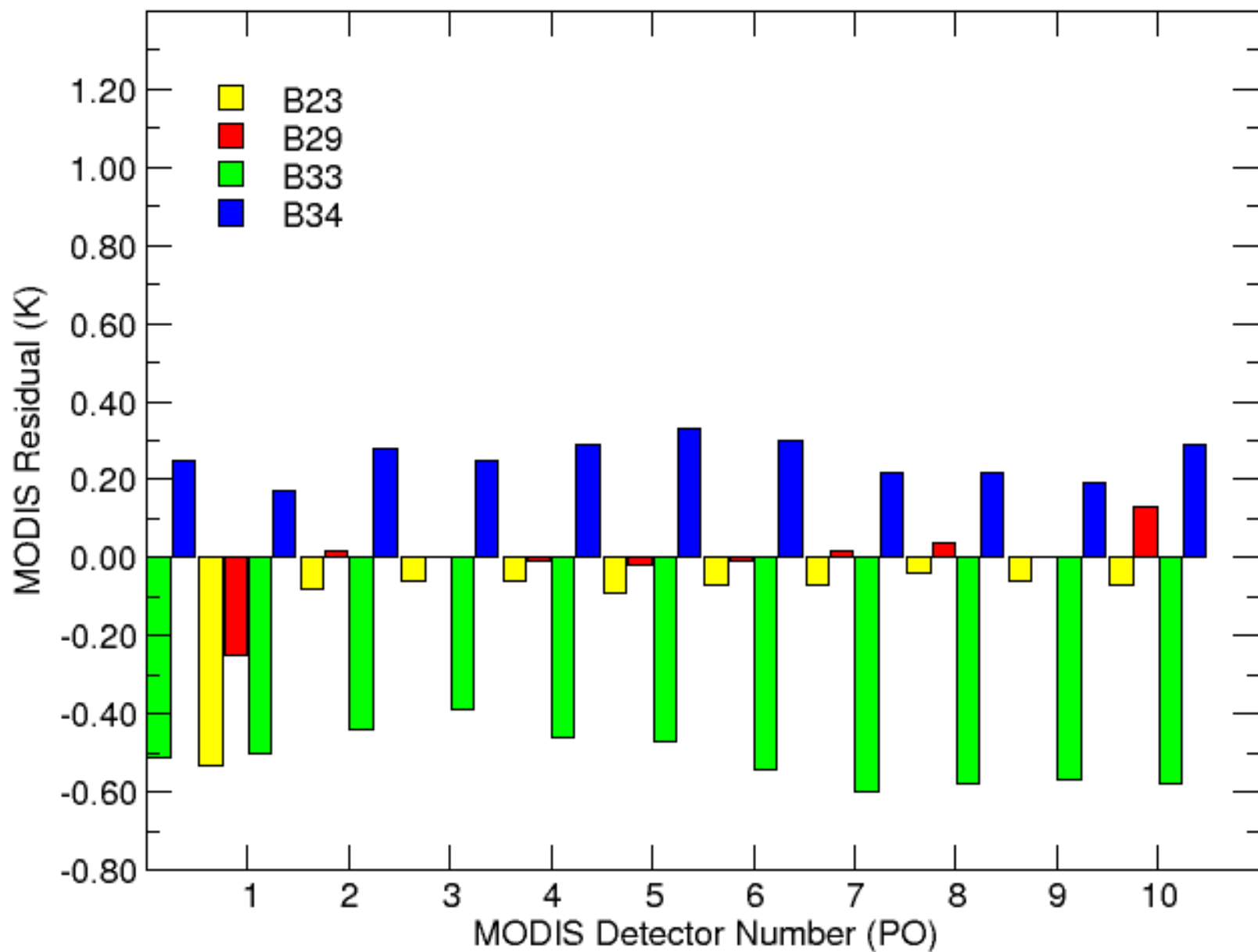
# Aqua MODIS Detector by Detector Residual

Oct 13, 2006; 1030 UTC; V5.0.7



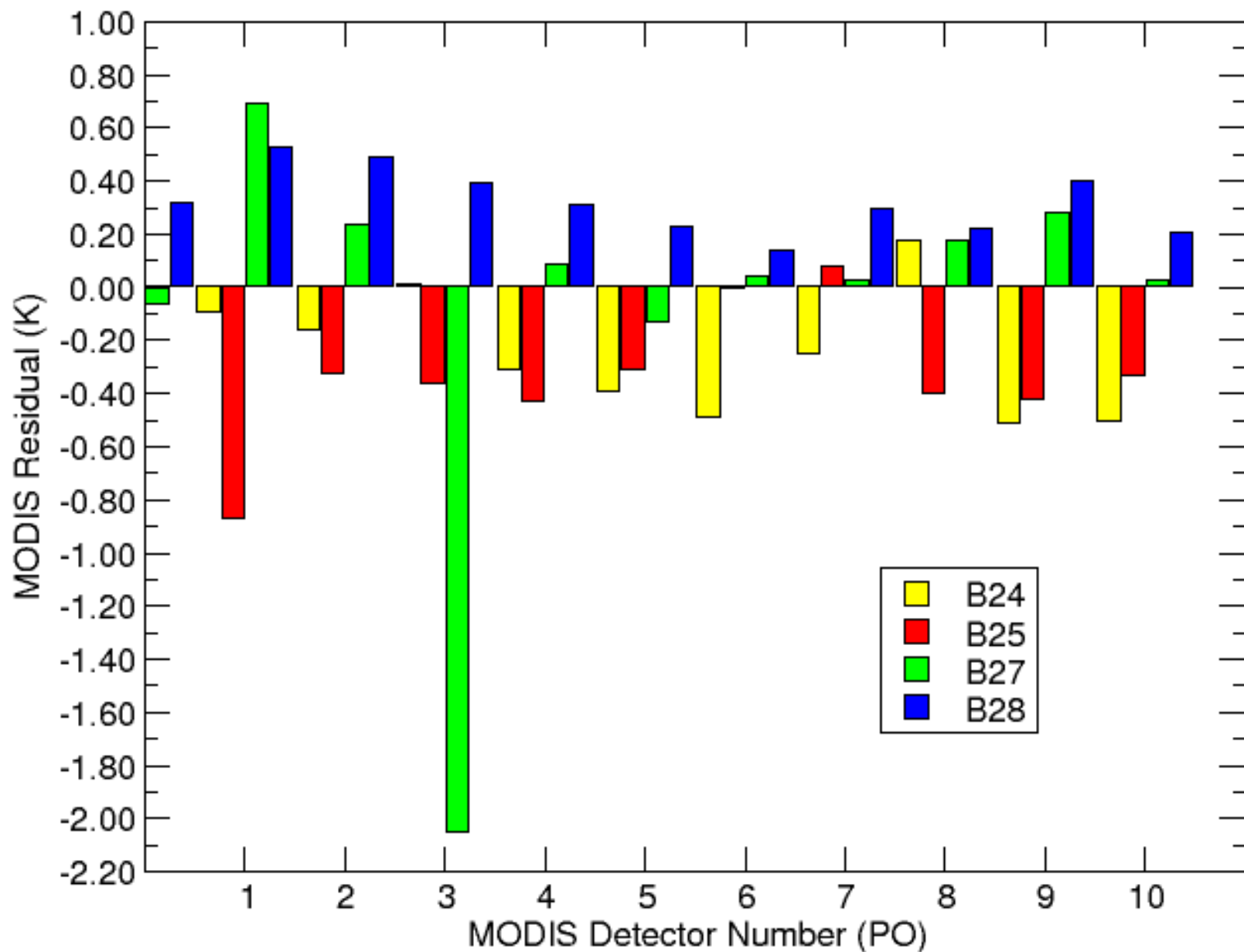
# Aqua MODIS Detector by Detector Residual

Oct 13, 2006; 1030 UTC; V6 Test



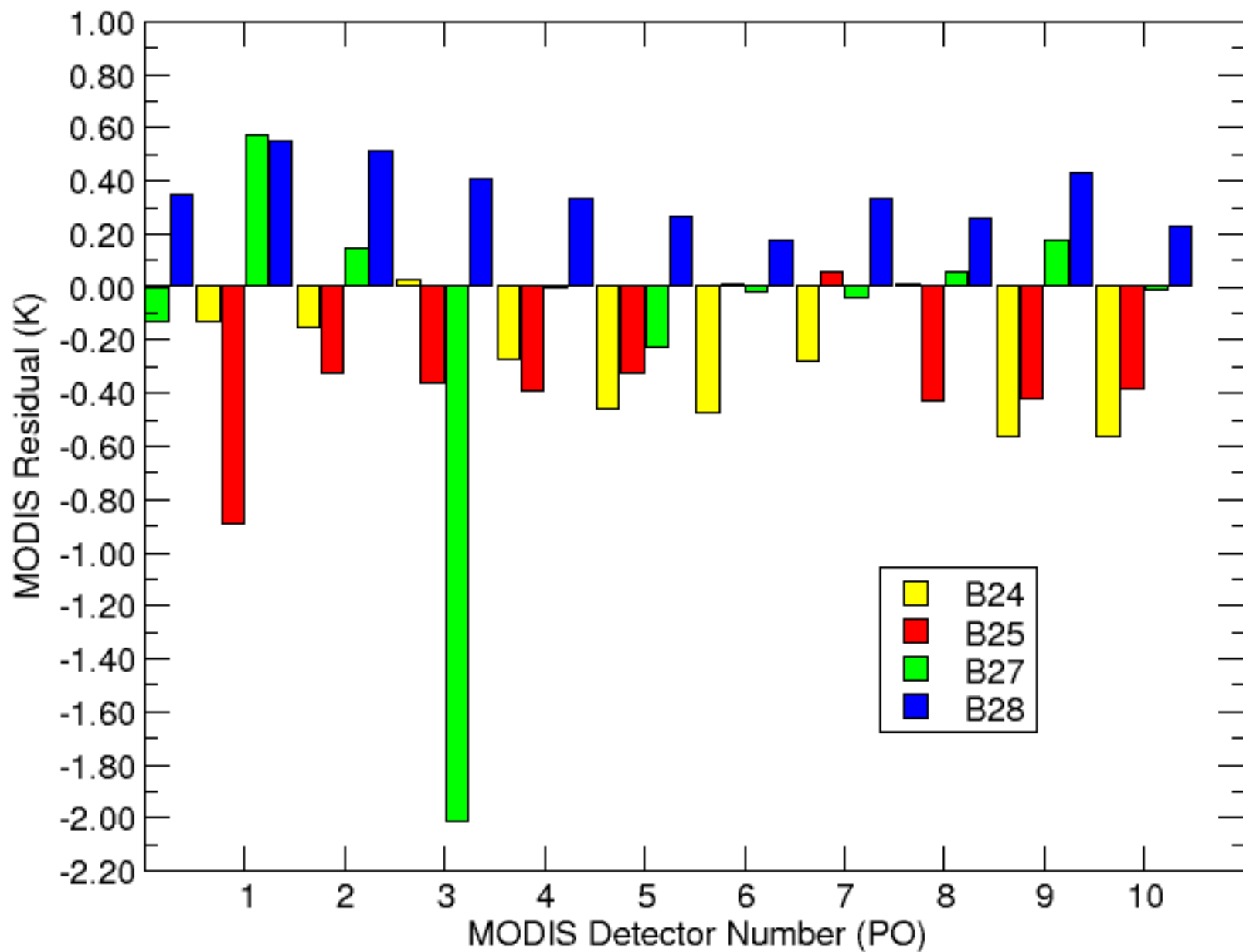
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# Summary

- Setting  $A_0 = 0$  shows little impact on Aqua MODIS radiometry for “typical” clear sky scene temperatures.
- Terra B24, 25, 27 and 28 all show significant reaction, possibly detrimental.
- Little of any apparent impact on detector striping.
- Window band temperatures of 285 K are not a stressing test of setting  $A_0 = 0$ . A one-day global data set for Aqua MODIS with  $A_0 = 0$  can be compared to AIRS radiances by U. Wisconsin.