

Cloud-Cleared Bias Statistics

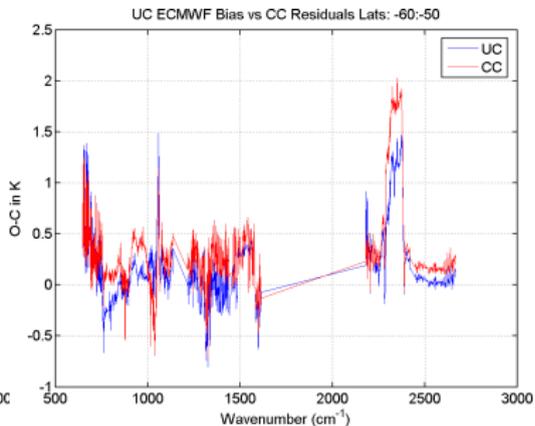
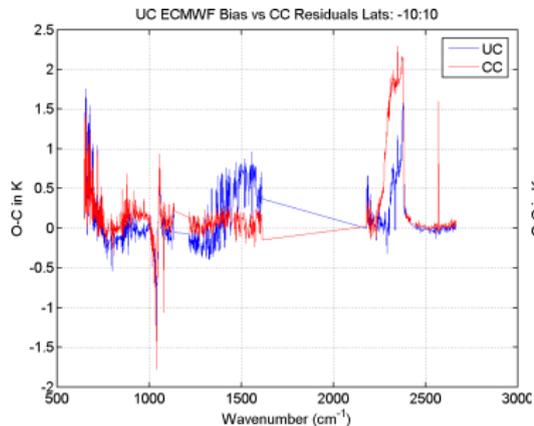
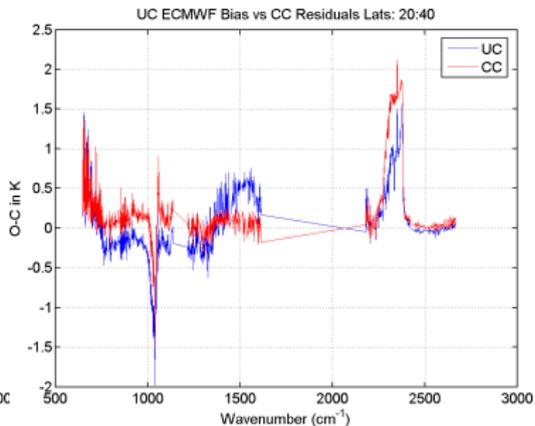
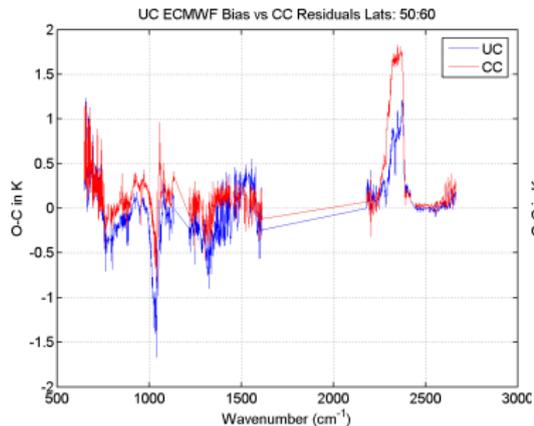
AIRS Science Team Meeting

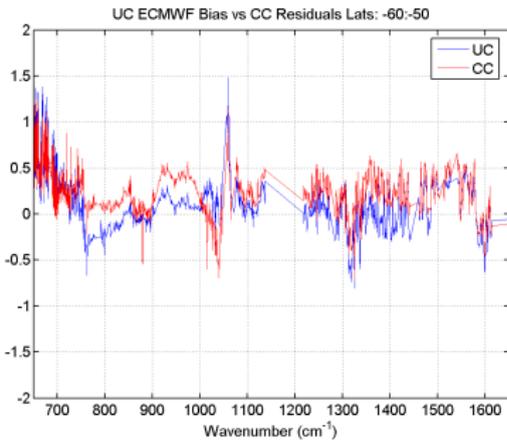
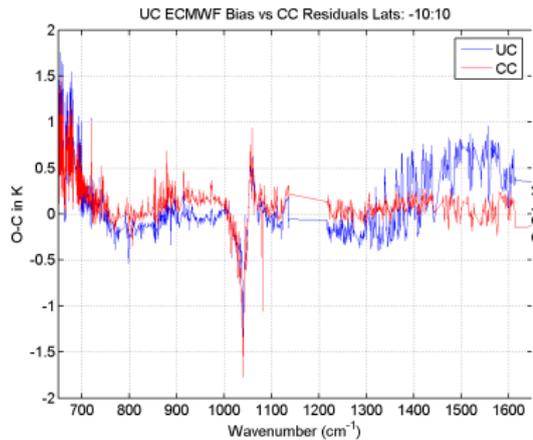
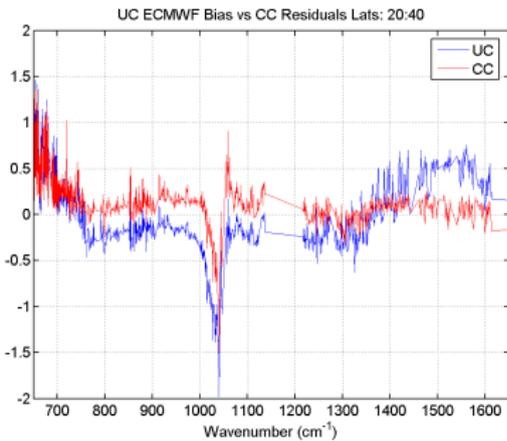
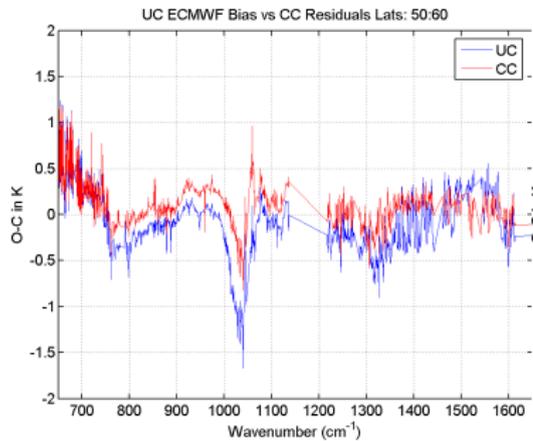
L.L. Strow and S.E. Hannon
(UMBC Physics Department)

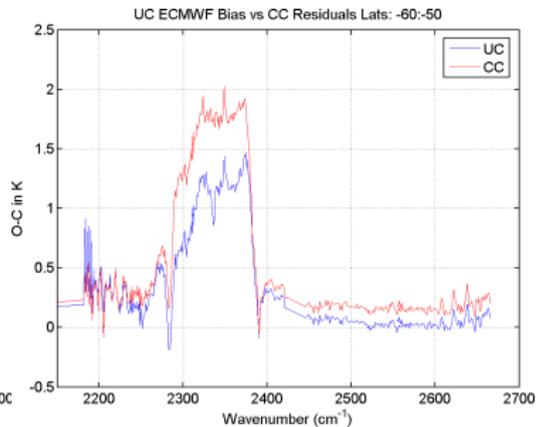
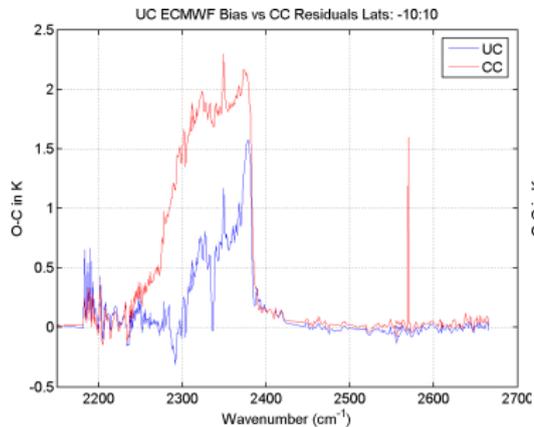
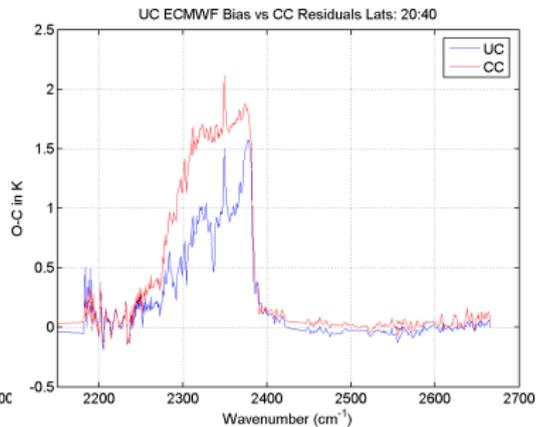
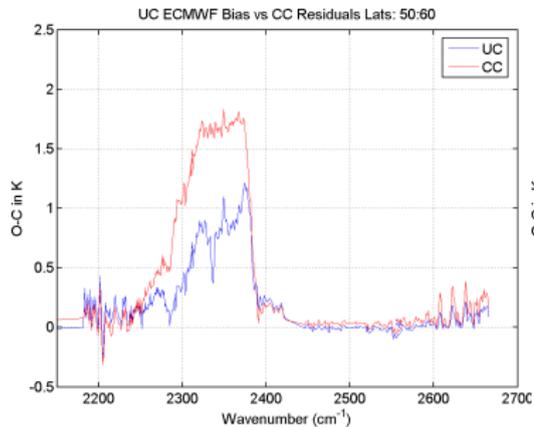
March 9, 2006

Introduction

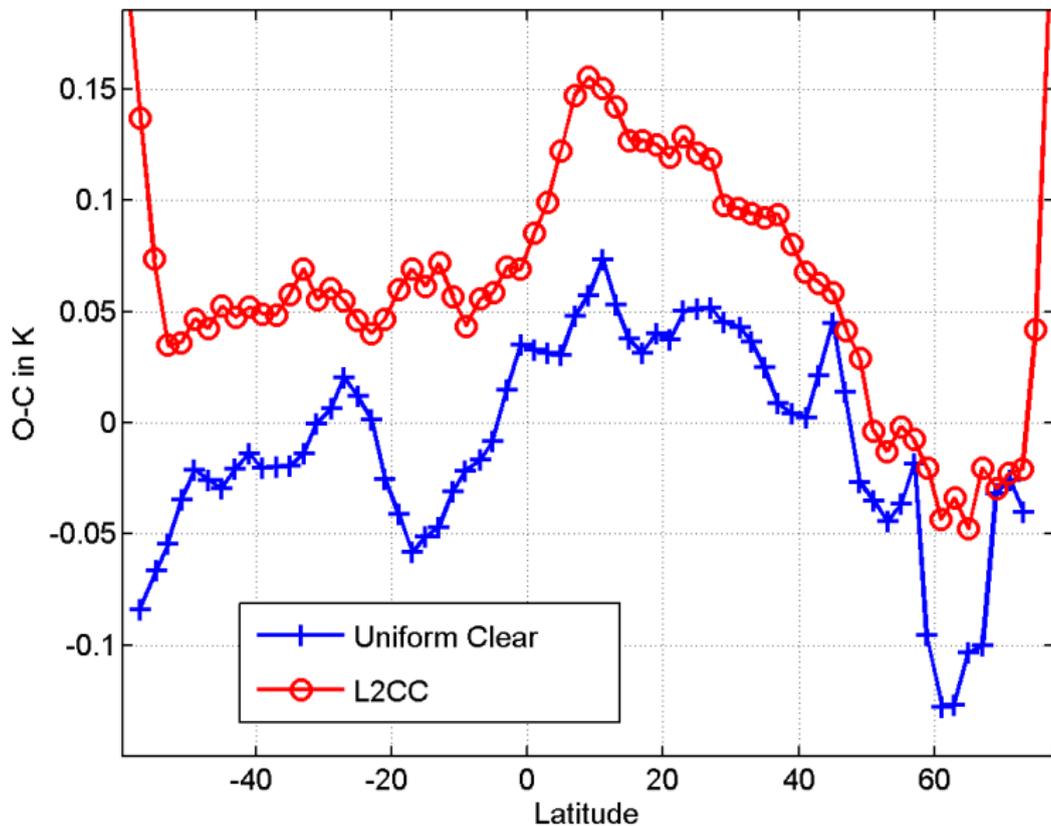
- UMBC AIRS RTA validation, and CO₂ retrievals, done with our “uniform_clear” (UC) product. Similar to L1B Clear Matchup subset.
- Use our “view” of radiances to examine quality of cloud-cleared radiances
- Looked at 1st week, Sept. 2004, *used L2 profile* so results are radiance residuals
- Compared to UC, which *used ECMWF profiles* so results are biases relative to ECMWF.
- We then also compare UC biases and standard deviations to cloud-cleared statistics, this time using ECMWF for the computed cloud-cleared radiances. These were done for the month of May, 2005.
- Quite preliminary



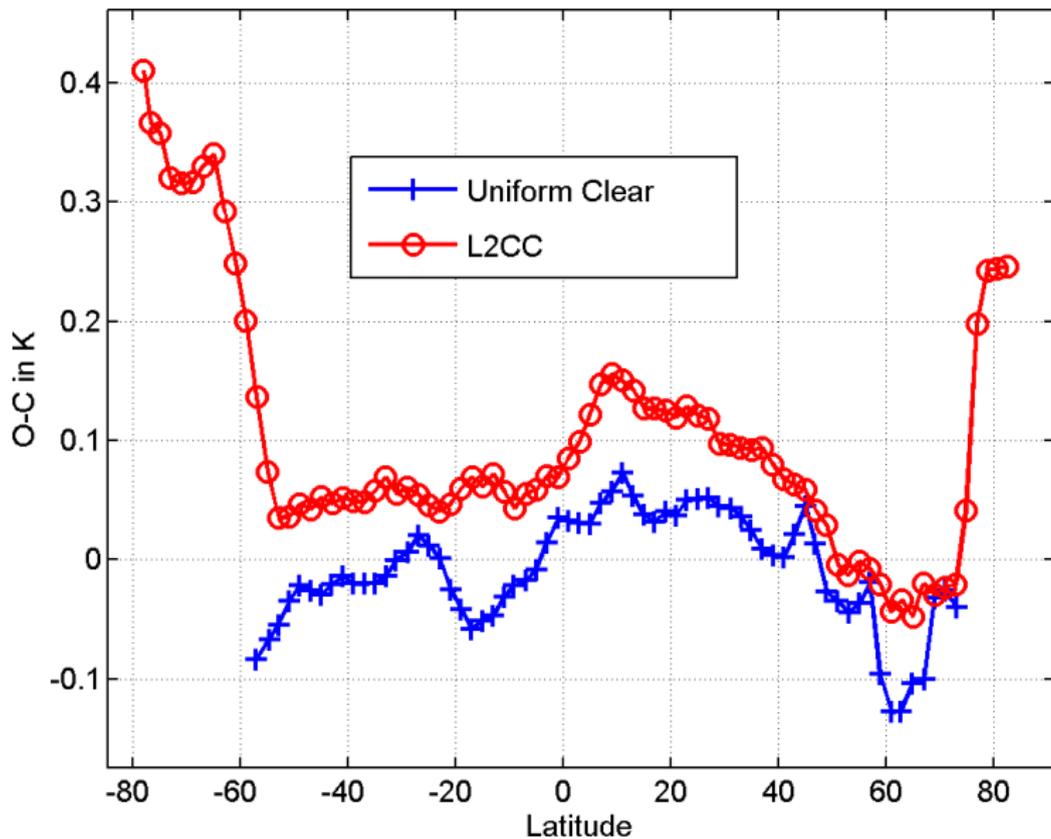




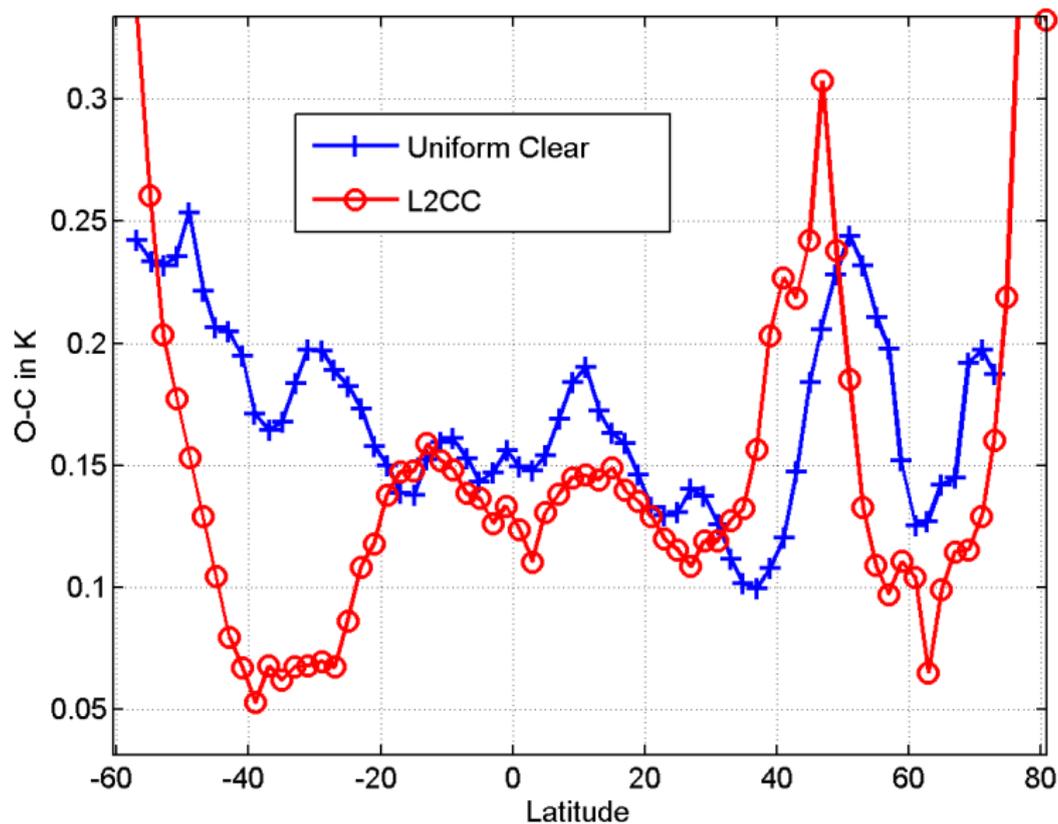
791 cm^{-1} : Ocean Only



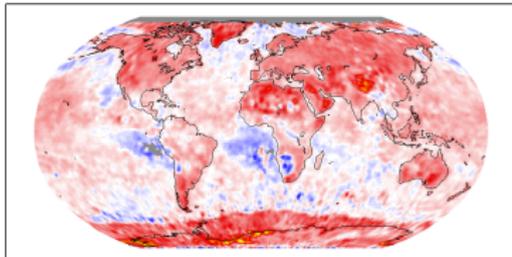
791 cm^{-1} : Ocean Only



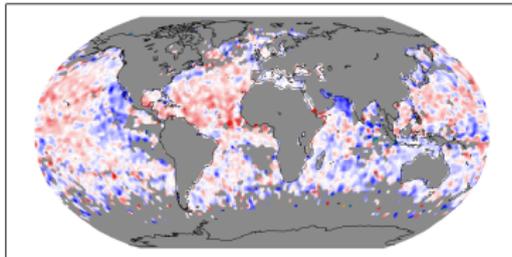
2396 cm^{-1} : Ocean Only



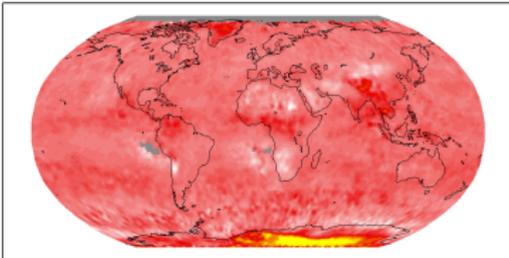
UC residuals; 791 cm^{-1}



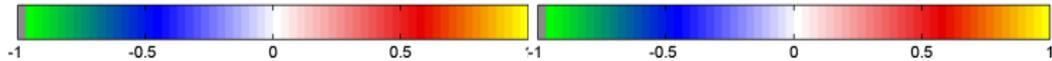
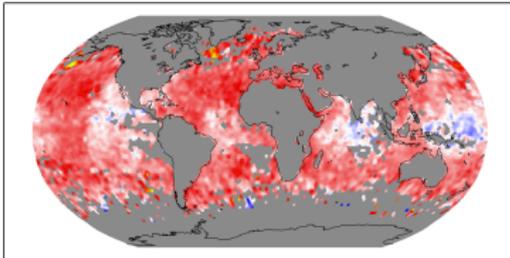
Uniform Clear Bias vs ECMWF; 791 cm^{-1}



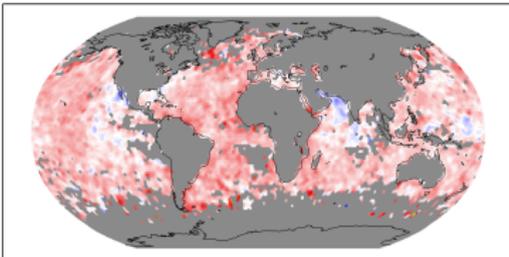
UC residuals; 2388 cm^{-1}



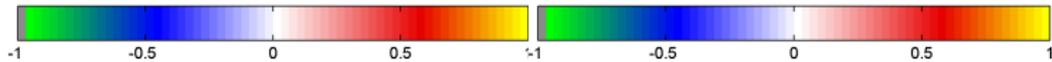
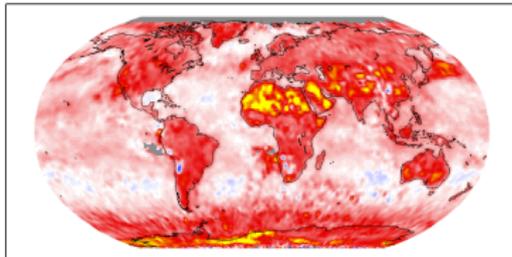
Uniform Clear Bias vs ECMWF; 2388 cm^{-1}



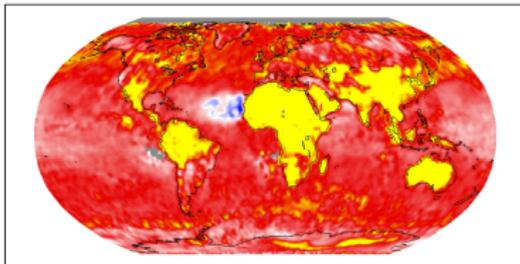
Uniform Clear Bias vs ECMWF; 2396 cm^{-1}



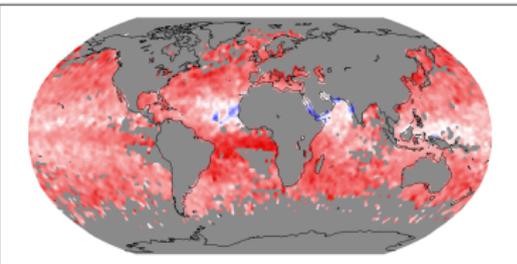
UC residuals; 2396 cm^{-1}



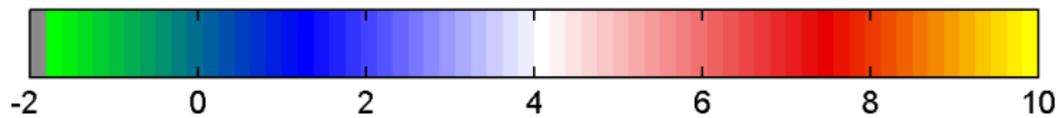
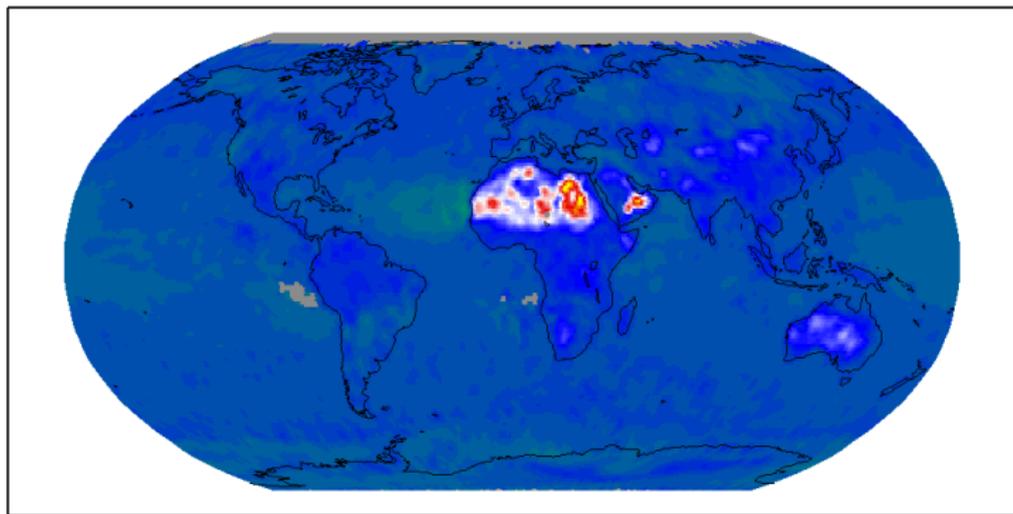
CC residuals; 961 - 1231 cm^{-1}



Uniform Clear Bias vs ECMWF; 961 - 1231 cm^{-1}



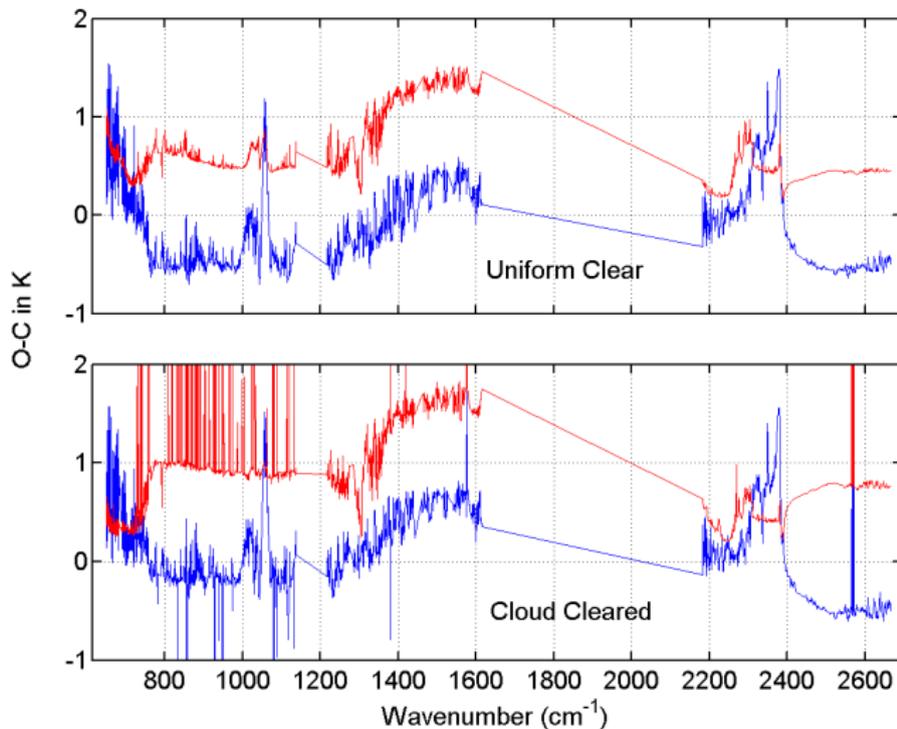
CC residuals; 961 - 1231 cm^{-1}



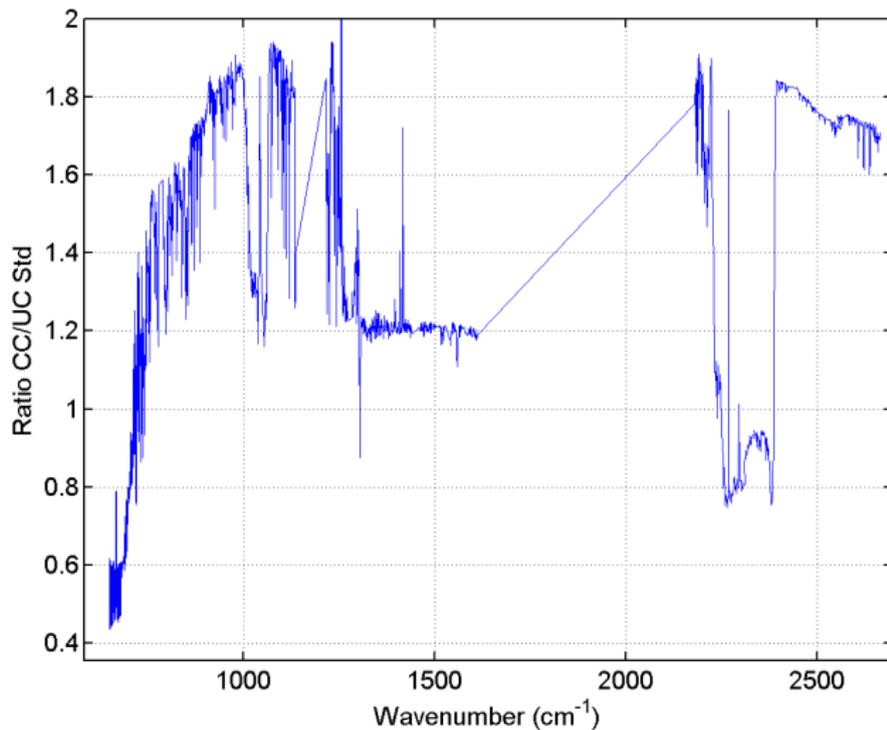
Cloud Cleared vs Uniform Clear Biases Relative to ECMWF

- We now present the bias and standard deviation of the cloud-cleared radiances in comparison to those using our uniform clear data set, *both* using ECMWF for the truth.
- We see noise (std) decreasing in the strongly absorbing channels, and increasing in channels seeing closer to the surface (and clouds), as expected.
- Data for May, 2005.

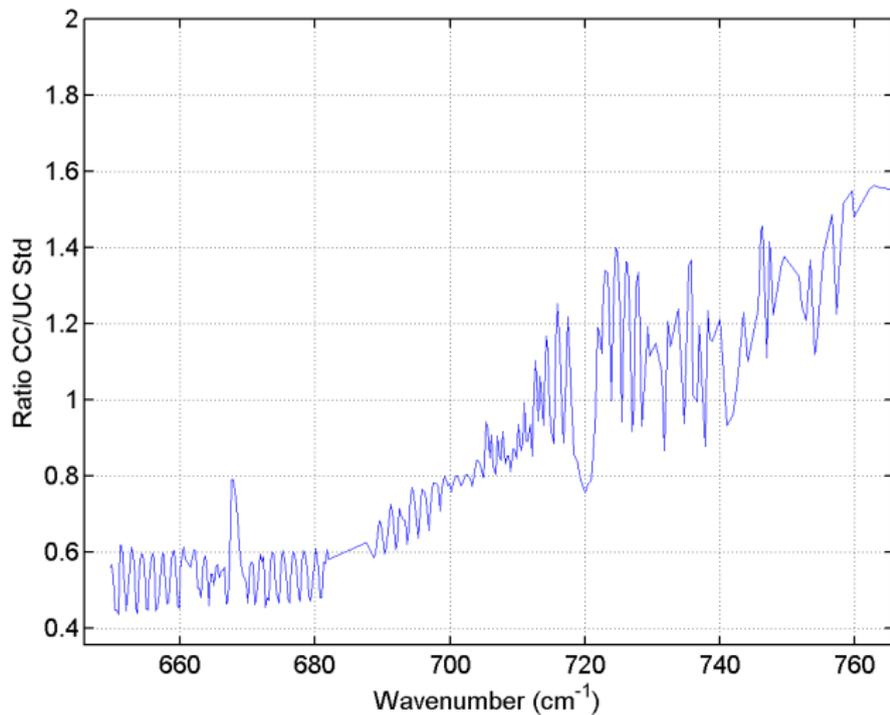
Uniform Clear and Cloud-Cleared *BOTH* Using ECMWF as the Truth



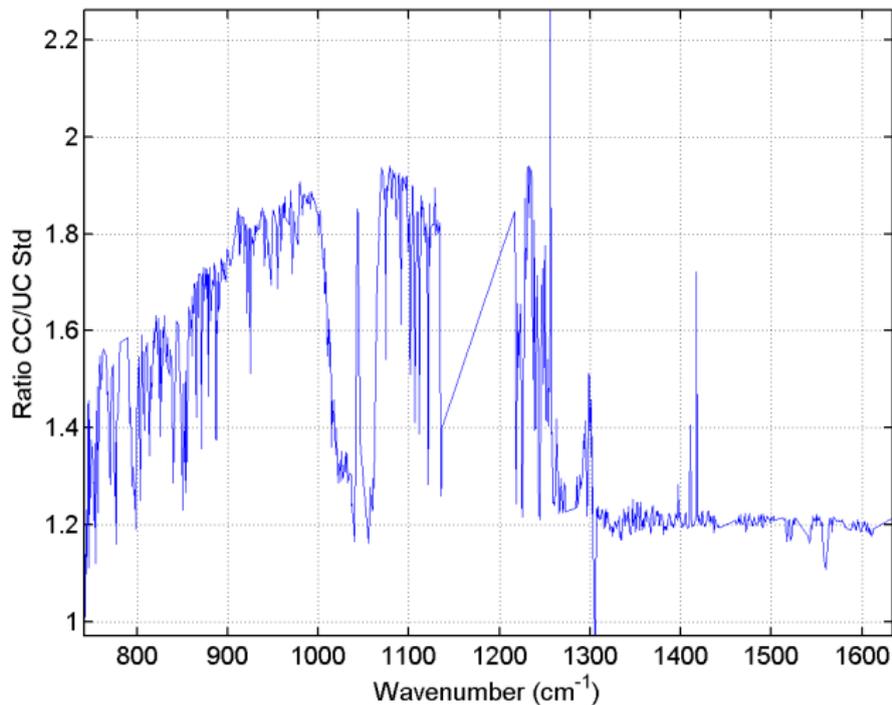
Ratio of Cloud Cleared to Uniform Clear Std



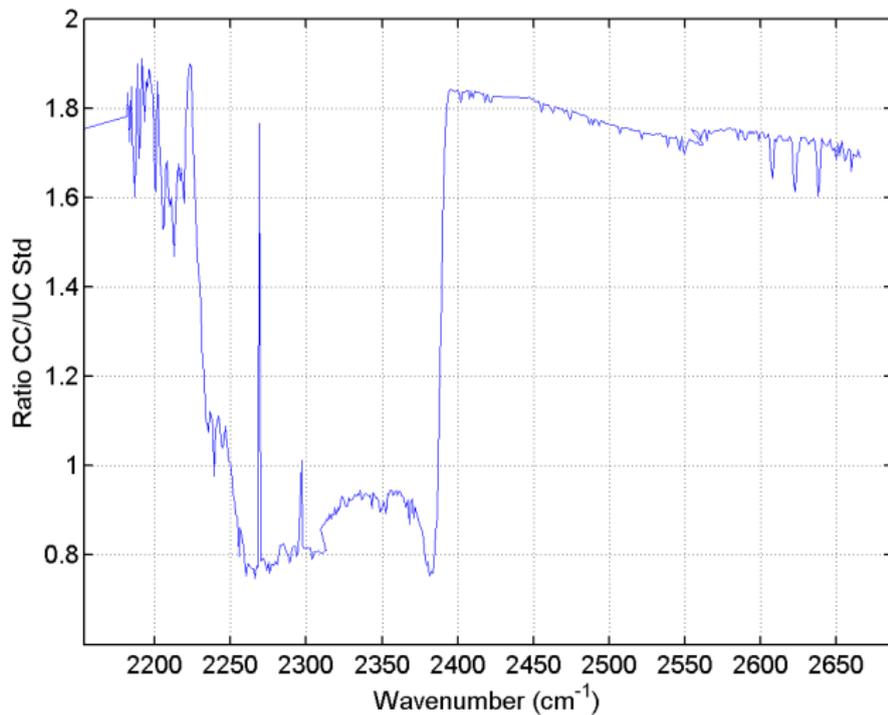
Ratio of Cloud Cleared to Uniform Clear Std: Zoom



Ratio of Cloud Cleared to Uniform Clear Std: Zoom



Ratio of Cloud Cleared to Uniform Clear Std: Zoom



Scan Angle Asymmetries

- Ocean clear: clear asymmetry pattern for surface channels
- High clouds: saw marginal asymmetry
- Cirrus (hard to get good statistics with our approach)

