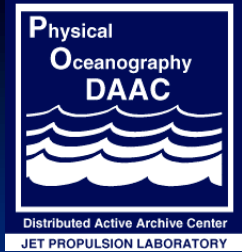


Comparisons of Infrared Satellite Derived SSTs with in-situ and Microwave Derived SSTs



Jorge Vazquez
Edward M. Armstrong
NASA/JPL/Caltech PO.DAAC
in collaboration with
Andy Harris/NOAA



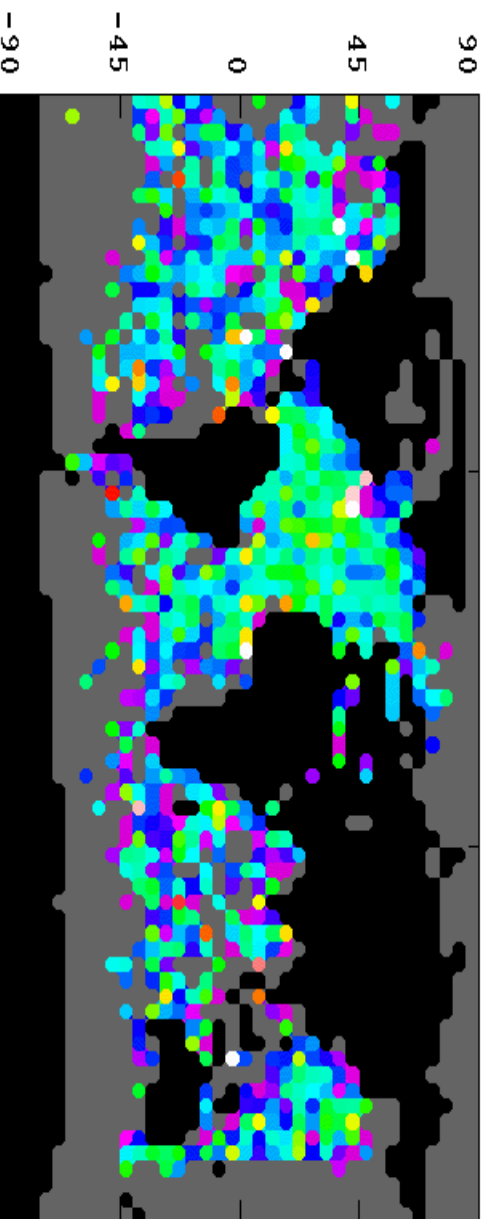
Presentation made at the second
CLIMAR Meeting

Brussels, Belgium November
2003

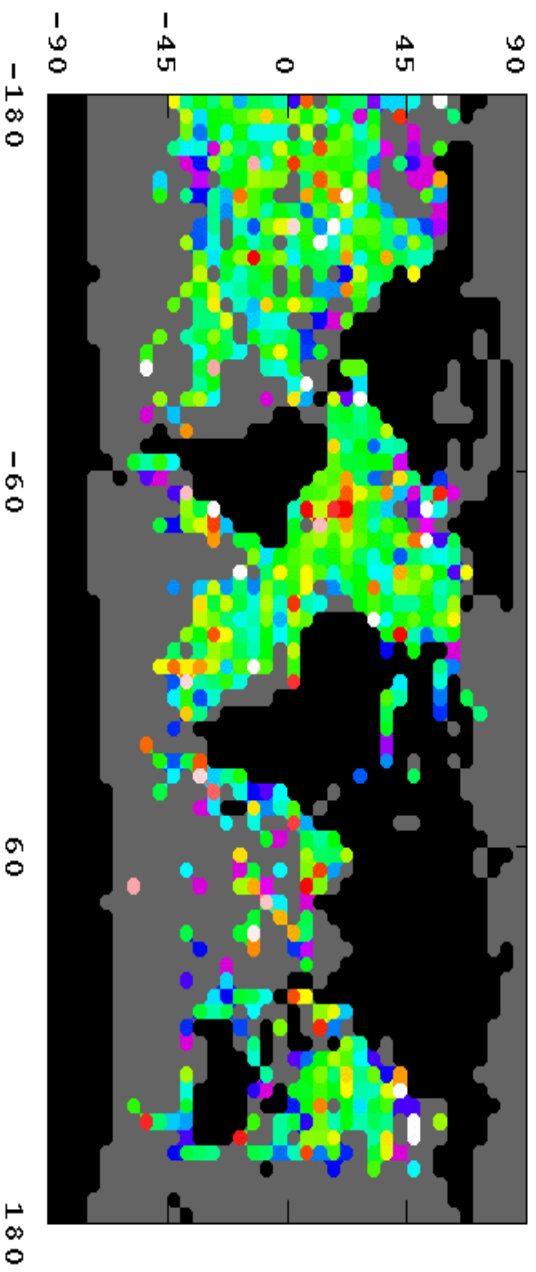
Outline of Talk

- Comparisons of the NOAA/NASA AVHRR Pathfinder 9km SSTs (MPFSST) and SSTs from the Along Track Scanning Radiometer (ATSR-2, ASST2) with in-situ data from the World Ocean Database version 02. Comparison done with different Pathfinder SST flags
- Correlations of differences between the MPFSST, ASST2 and TMI microwave derived SSTs and water vapor, aerosols, and wind speed from SSMI

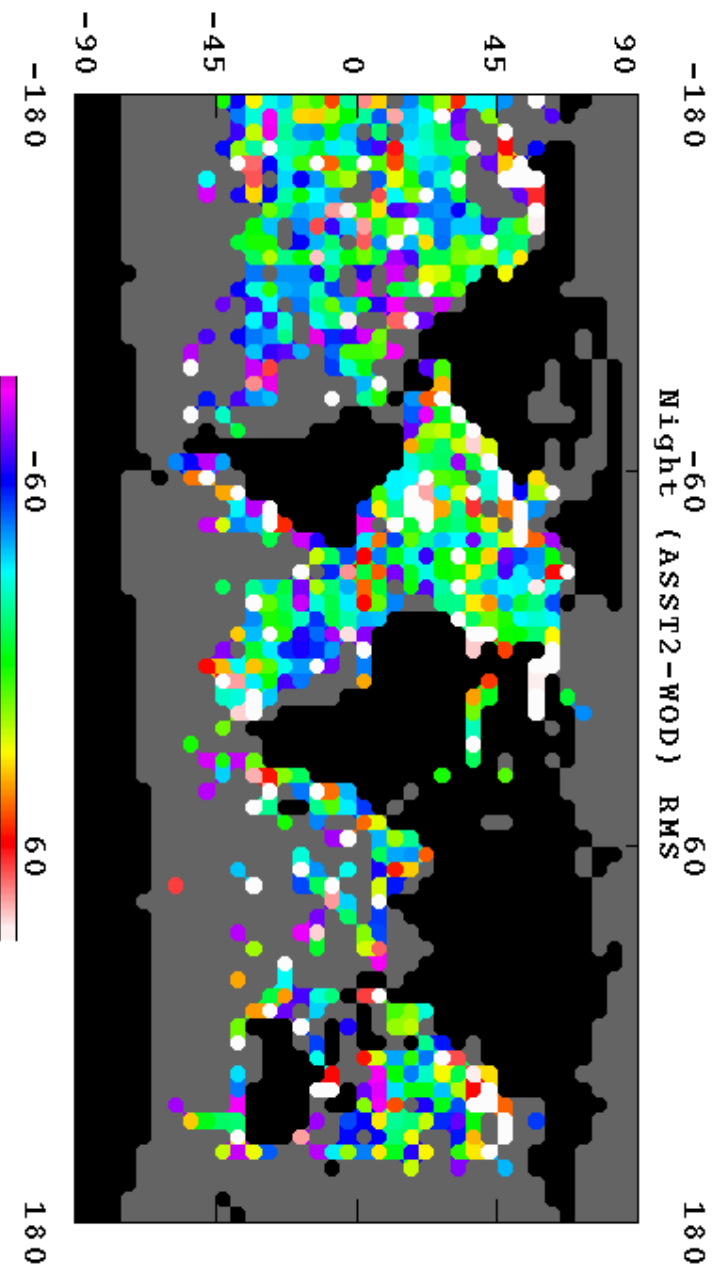
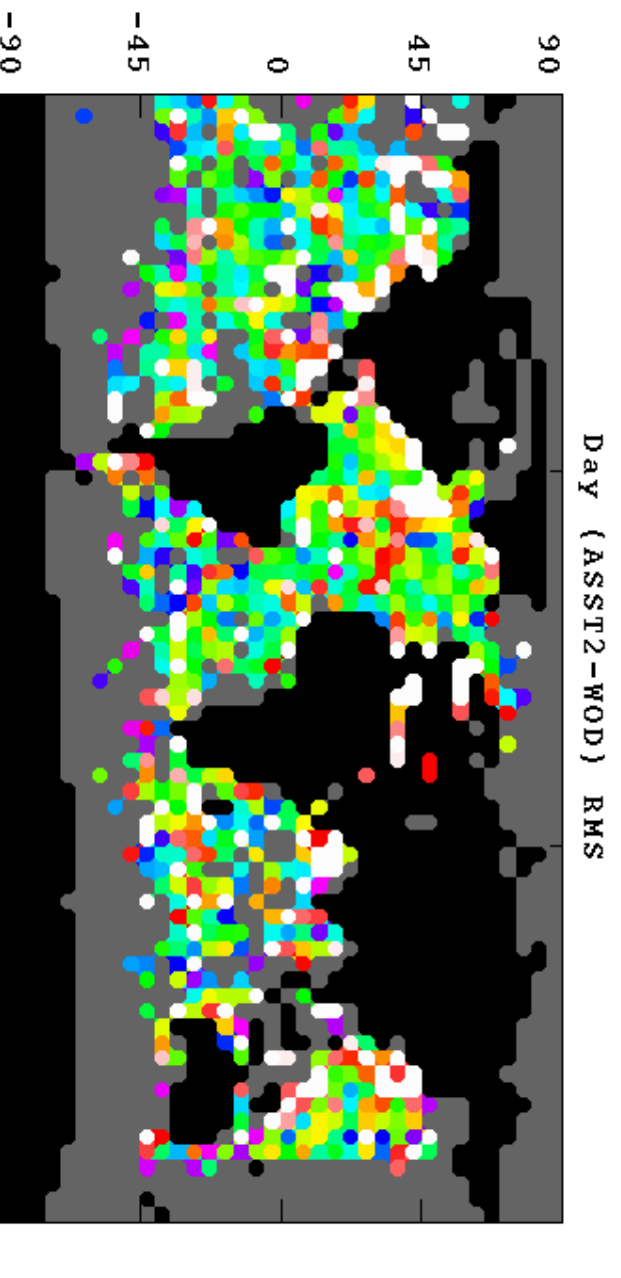
Day ASST2-WOD



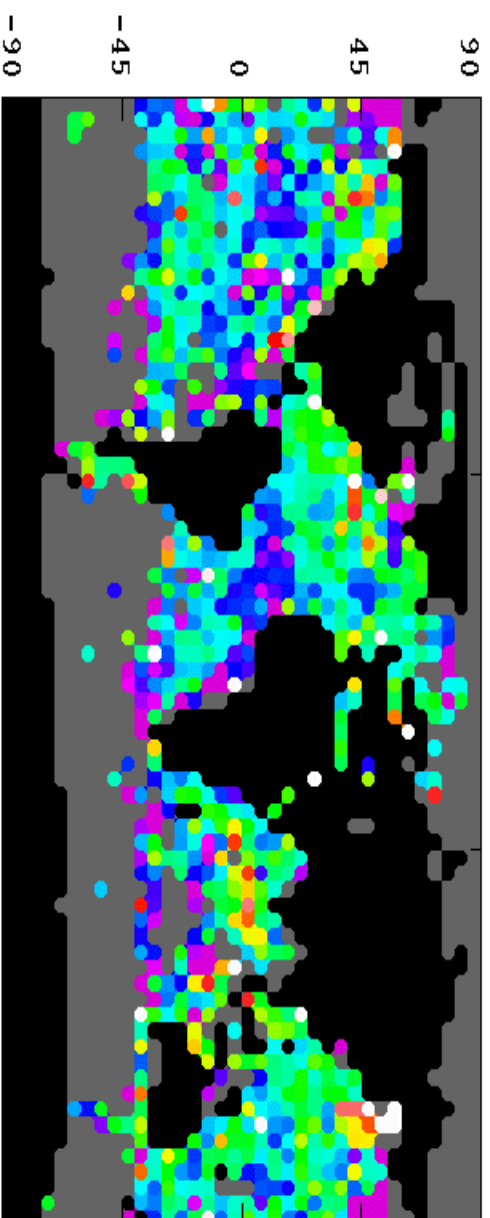
Night ASST2-WOD



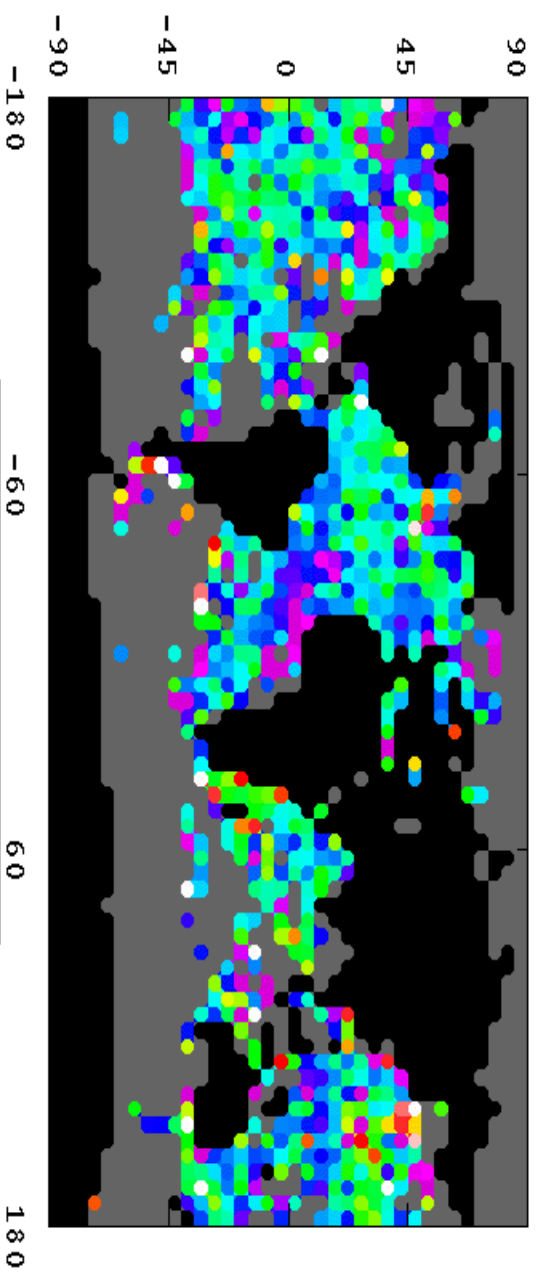
-1.00 -0.60 0.00 0.60 1.00
Degrees C



Day MPFSST Flag 4-WOD

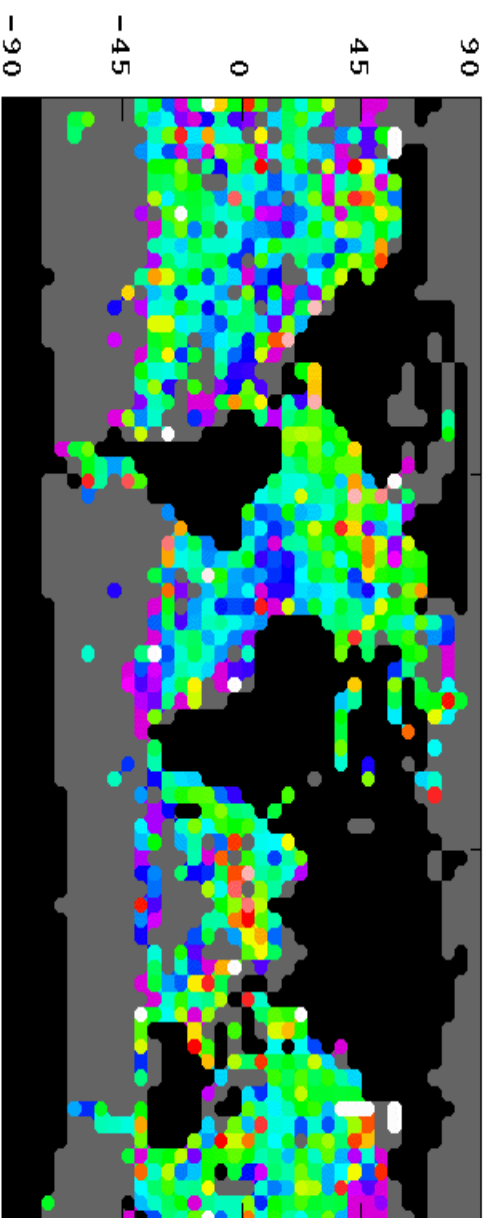


Night MPFSST Flag 4-WOD

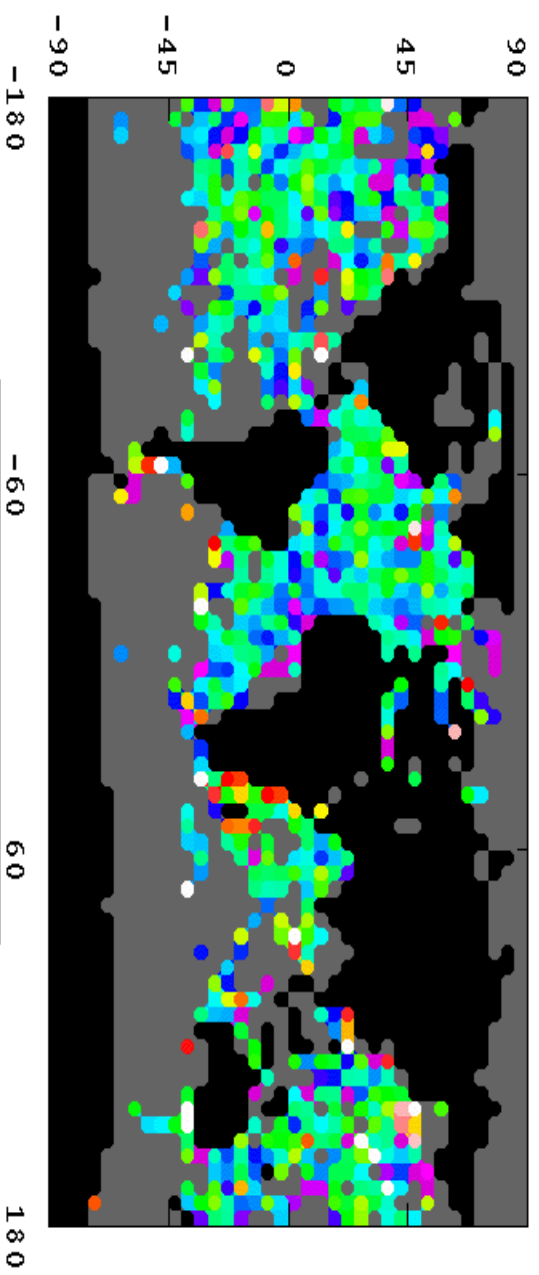


-1.00 -0.60 0.00 0.60 1.00
Degrees C

Day MPFSST Flag 7-WOD

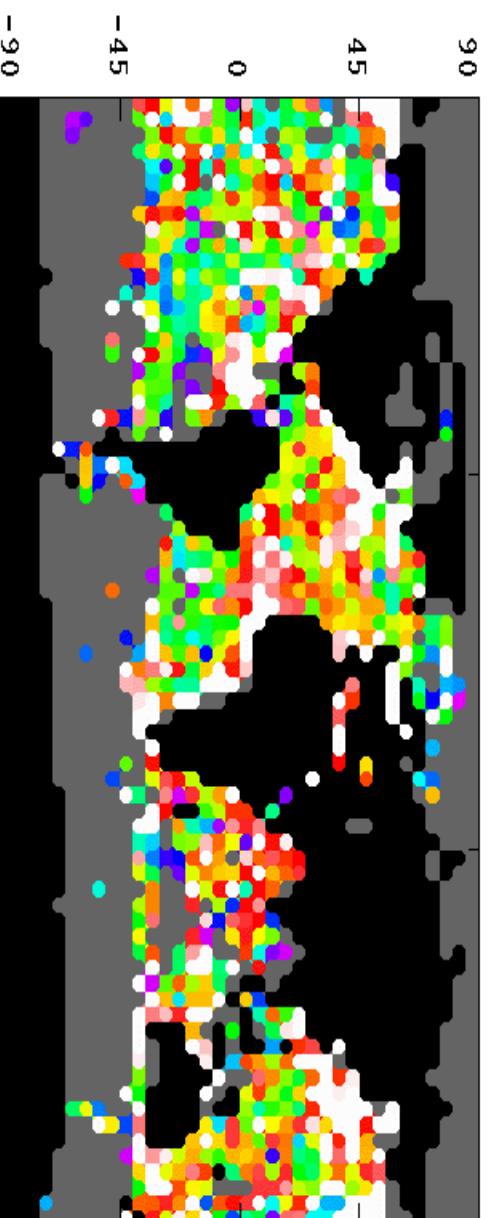


Night MPFSST Flag 7-WOD

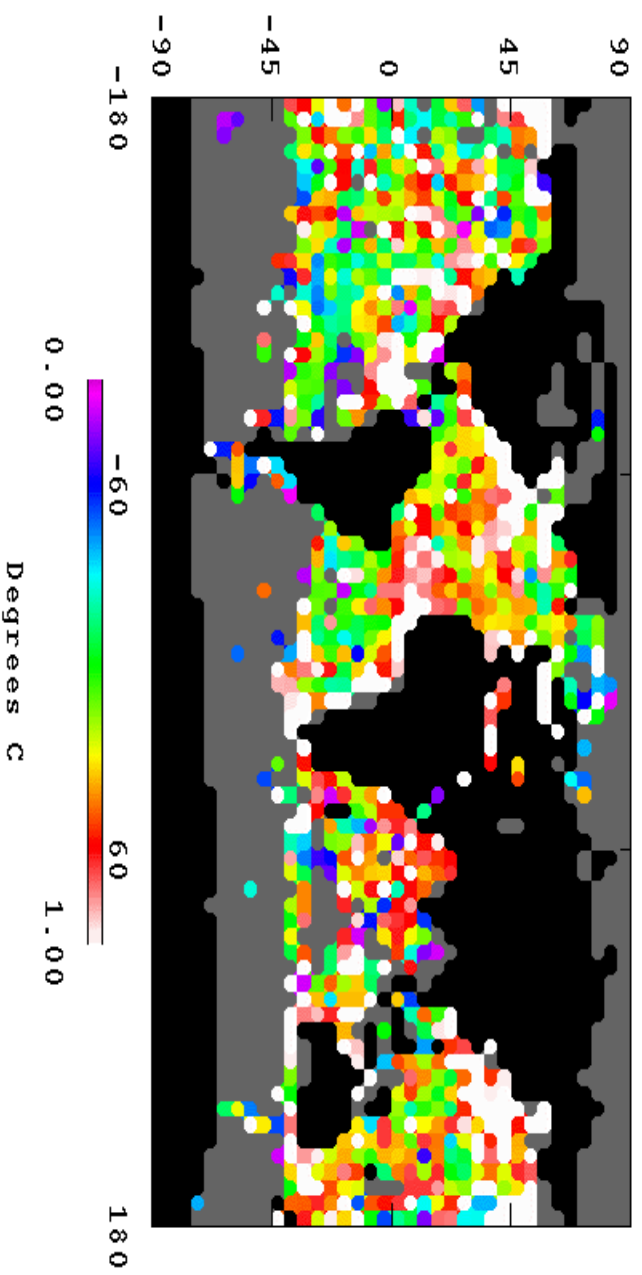


-1.00 -0.60 0.00 0.60 1.00
Degrees C

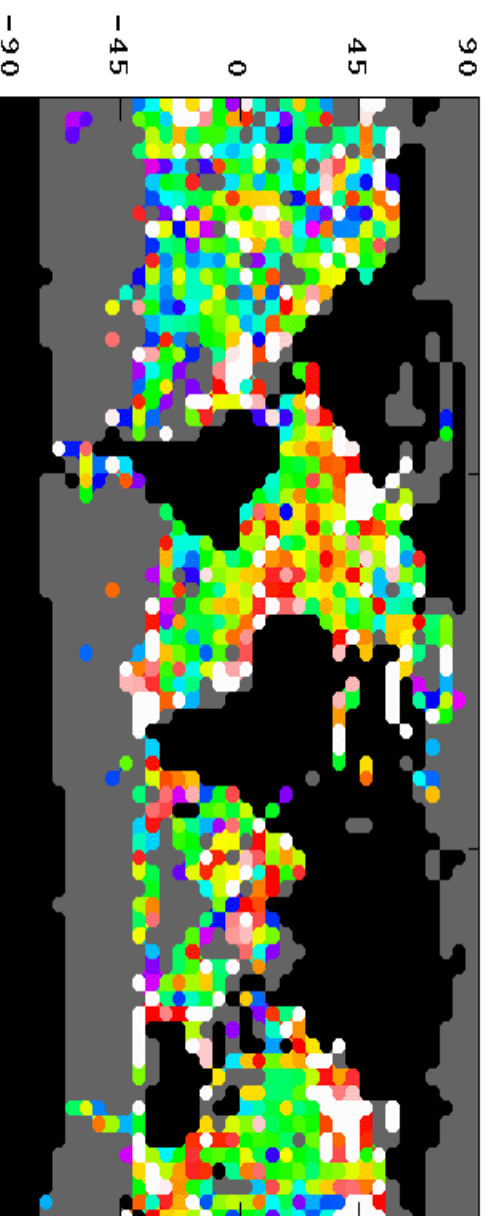
Day (MPFSST flag4-WOD) RMS



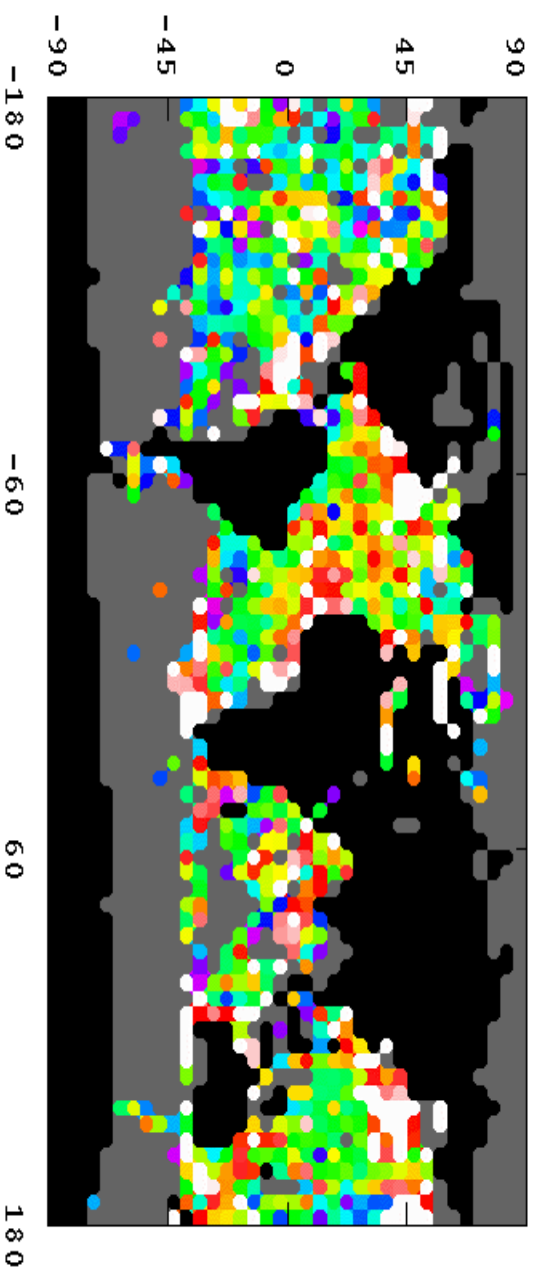
Night (MPFSST flag4-WOD) RMS



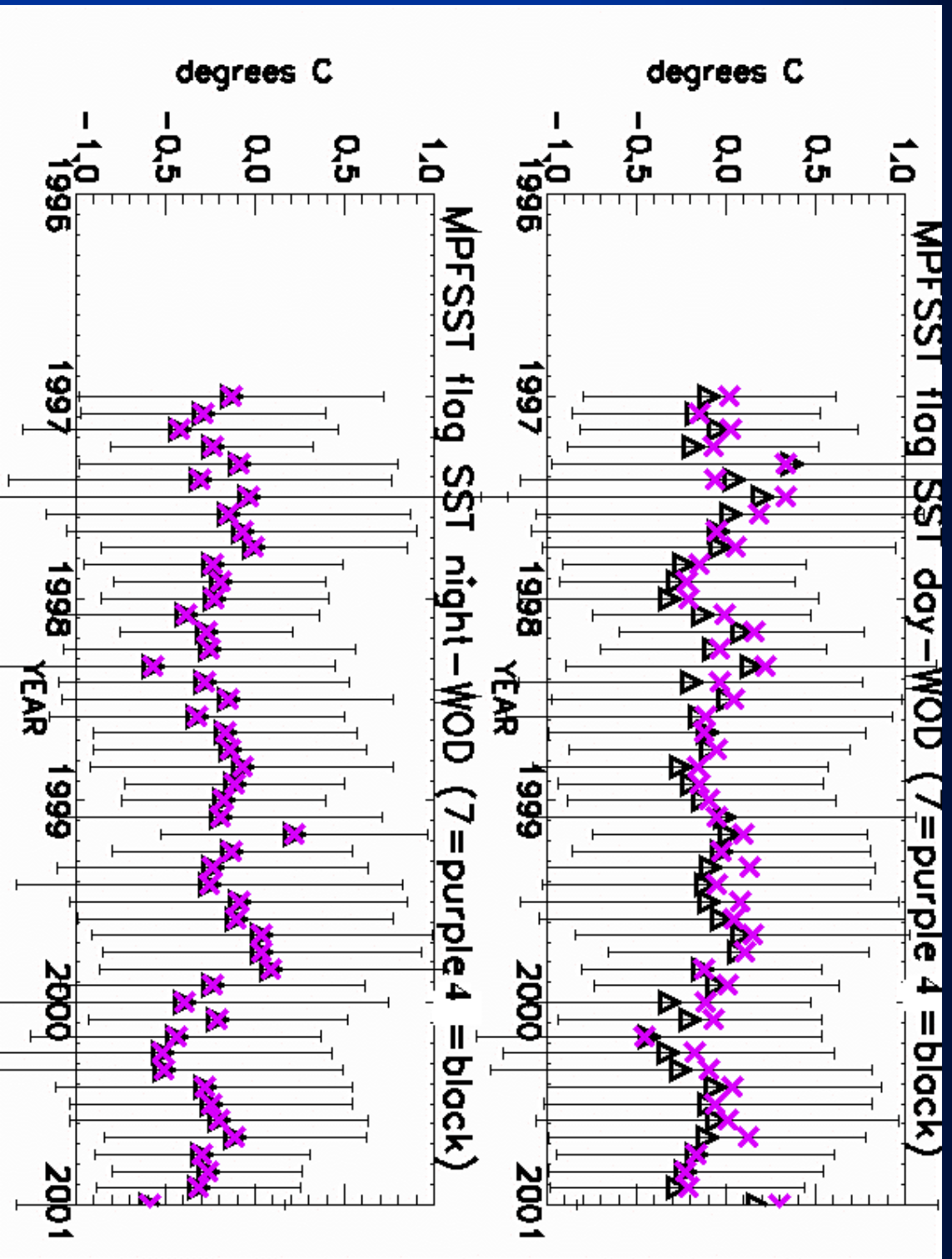
Day (MPFSST Flag7-WOD) RMS

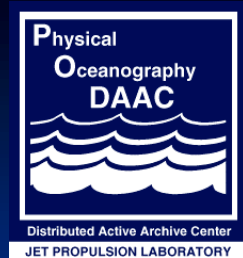


Night (MPFSST Flag7-WOD) RMS



0.00 -60 60 1.00
Degrees C





ATSR2- WOD02 (degrees Celsius)

Mean = -0.31 ± 0.84 (Daytime)

Mean= $-.02 \pm 0.77$ (Nighttime)

MPFSST Flag 4 - WOD02

Mean = -0.12 ± 0.86 (Daytime)

Mean= -0.24 ± 0.81 (Nighttime)

MPFSST Flag7 - WOD

Mean = -0.04 ± 0.79 (Daytime)

Mean= -0.17 ± 0.76 (Nighttime)

Correlations

- Multiple Correlation between MPFSST-TMI and ASST2-TMI vs. aerosols, winds, and vapor
- Partial Correlations between
 - MPFSST-TMI and ASST2-TMI vs. aerosols
 - MPFSST-TMI and ASST2-TMI vs. winds
 - MPFSST-TMI and ASST2-TMI vs. vapor

MPFSST-TMI Seasonal

Day

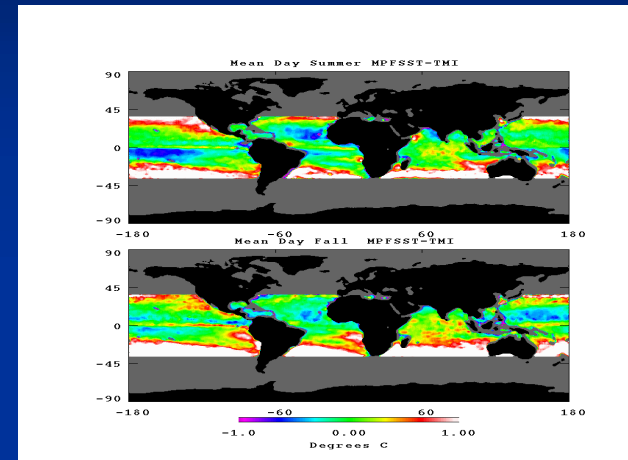
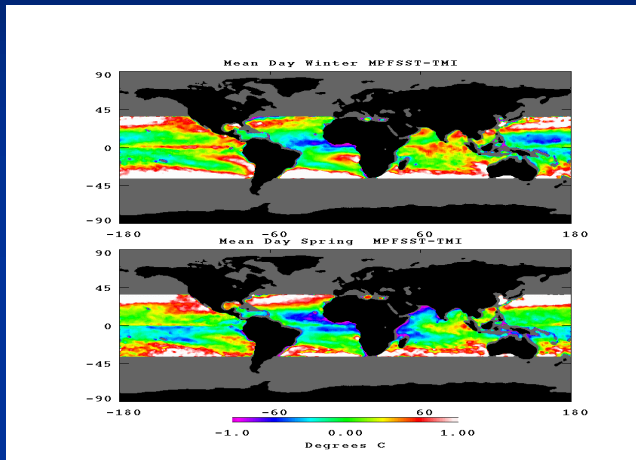
Day

Winter

Summer

Spring

Fall



Night

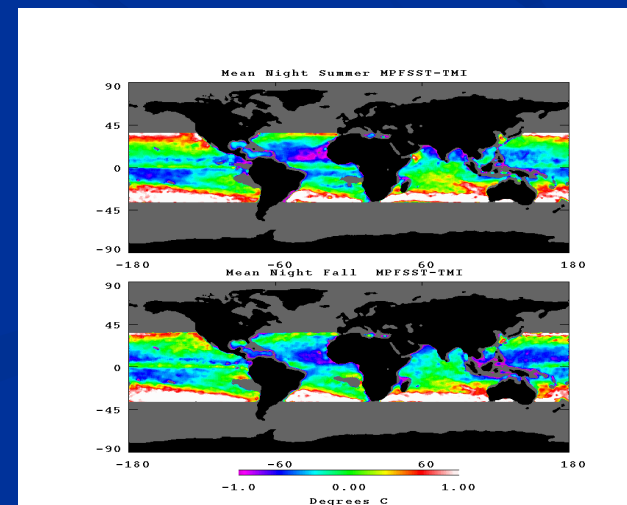
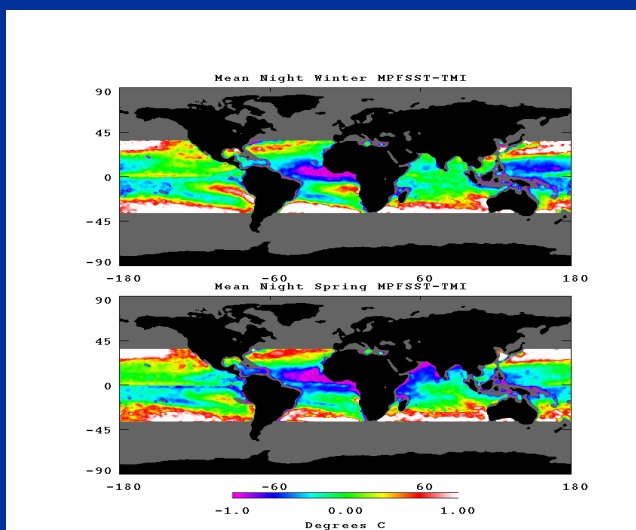
Night

Winter

Summer

Spring

Fall



ASST2-TMI Seasonal

Day

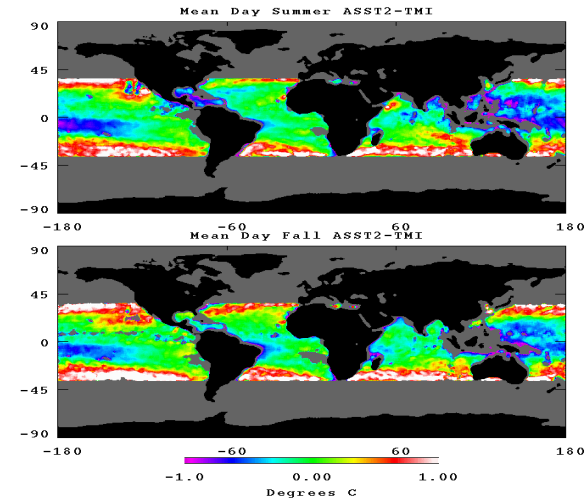
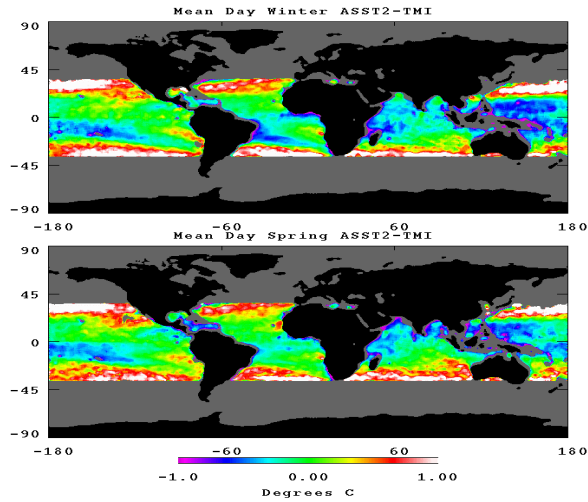
Day

Winter

Summer

Spring

Fall



Night

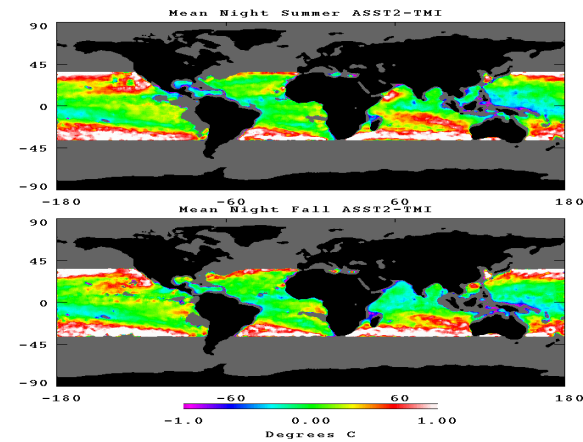
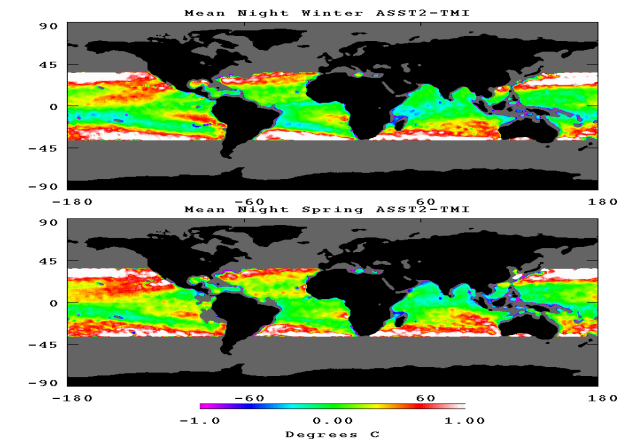
Night

Winter

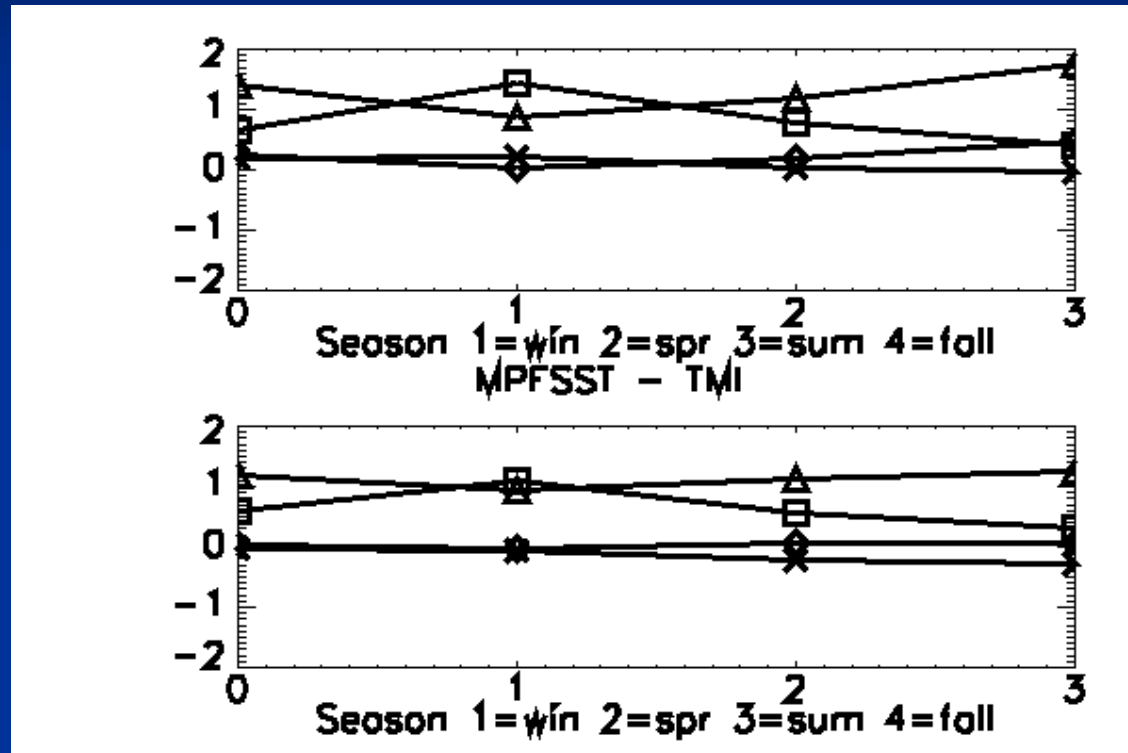
Summer

Spring

Fall



MPFSST-TMI Seasonal Latitude Bands

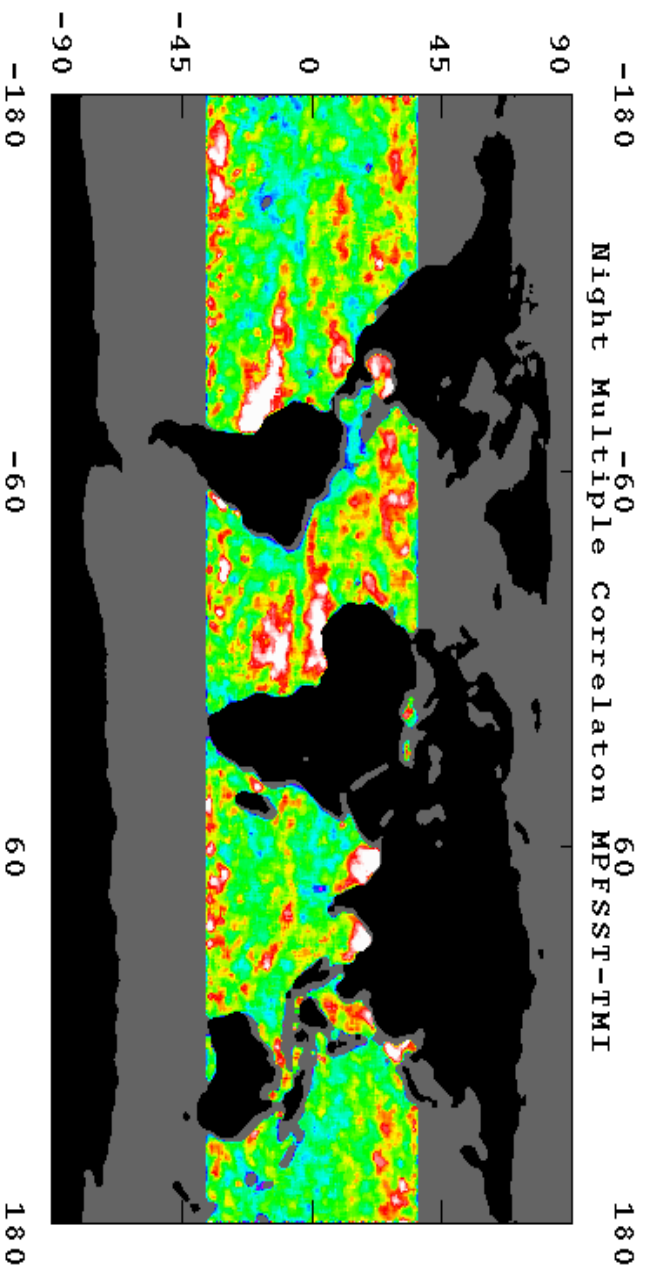
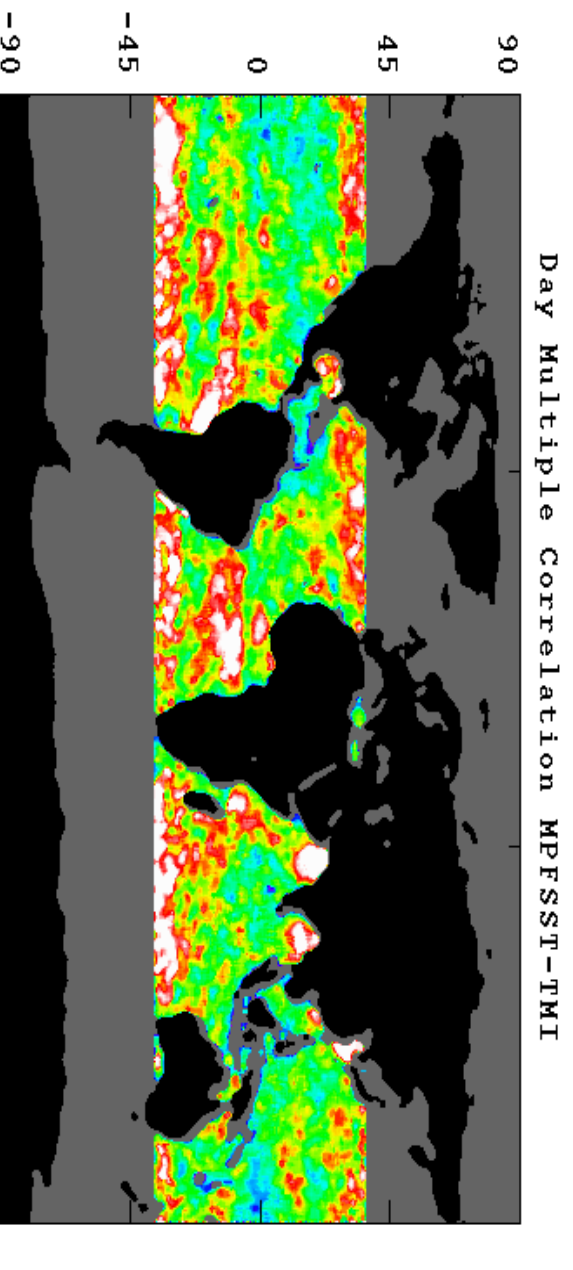


▲ 40S to 30S

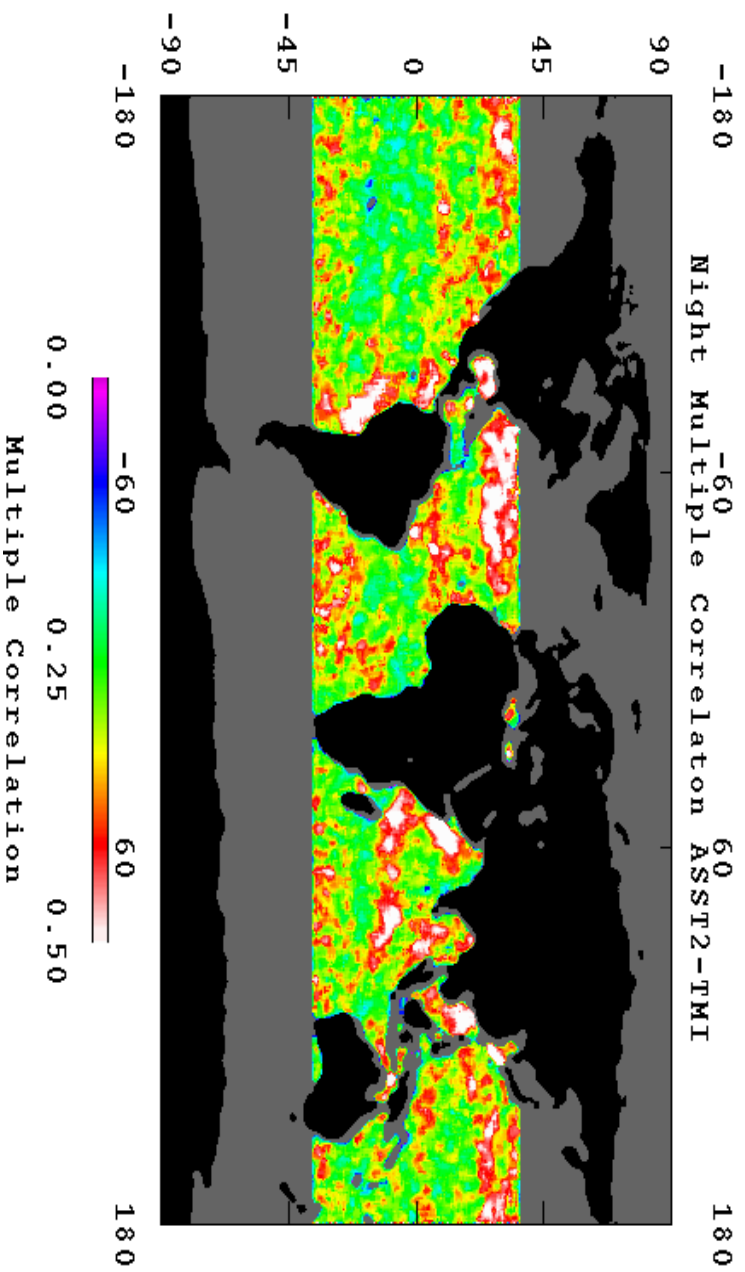
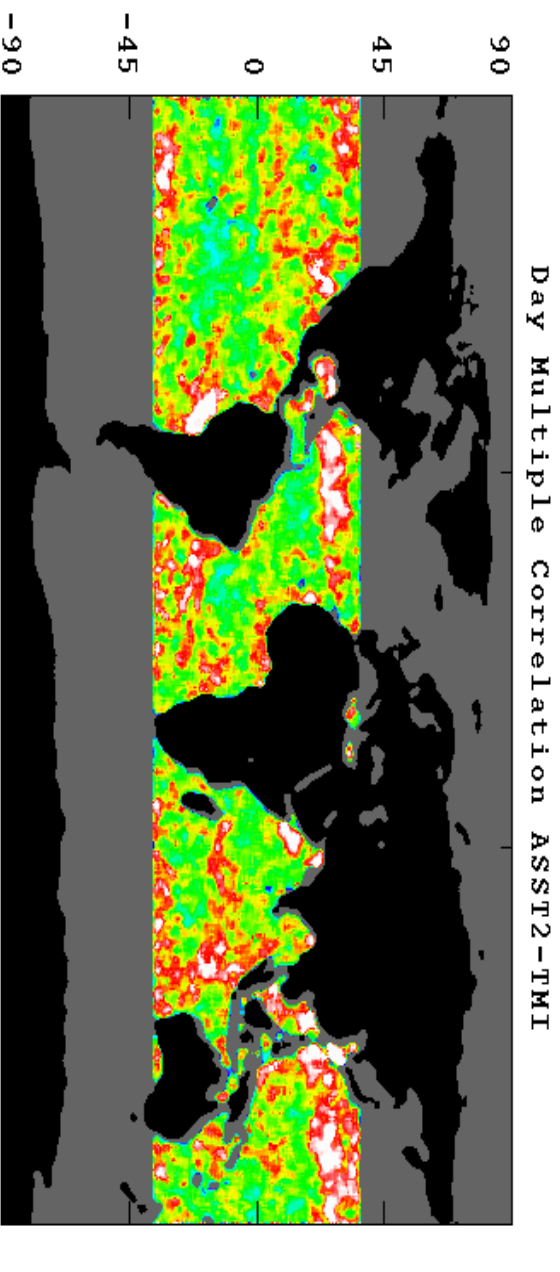
◆ 30S to 0

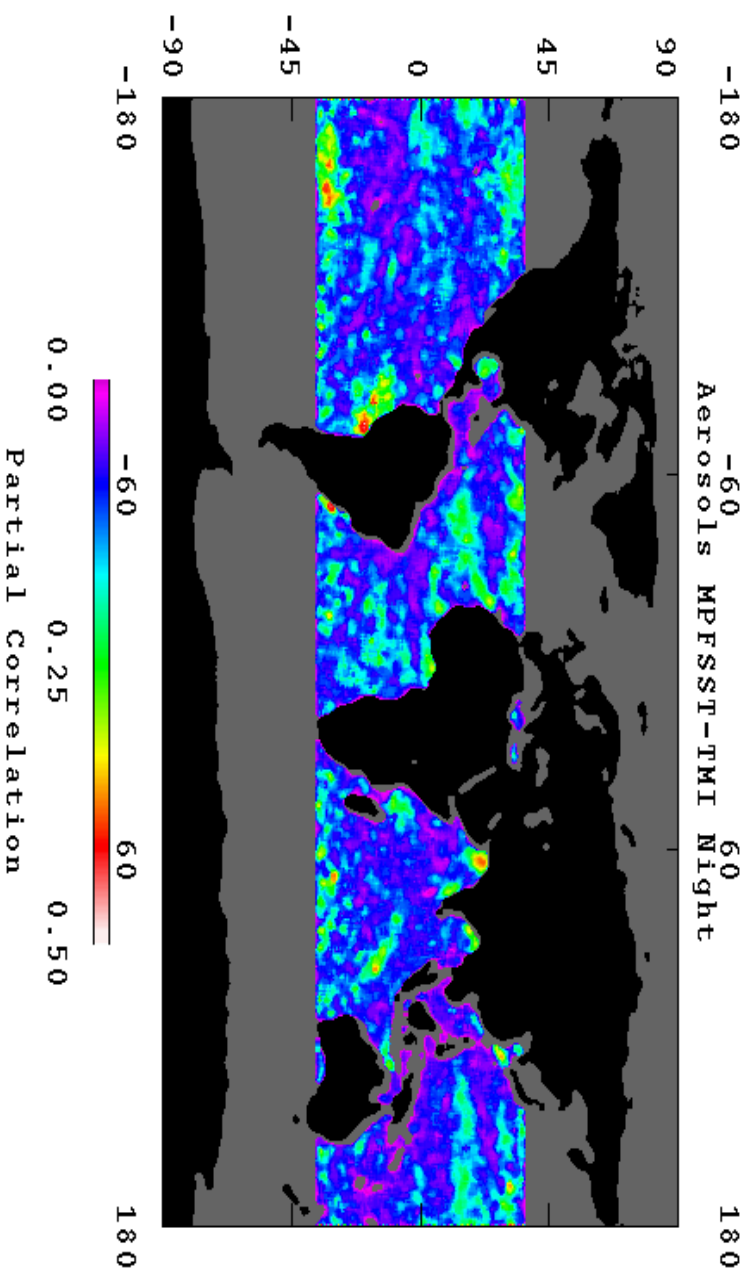
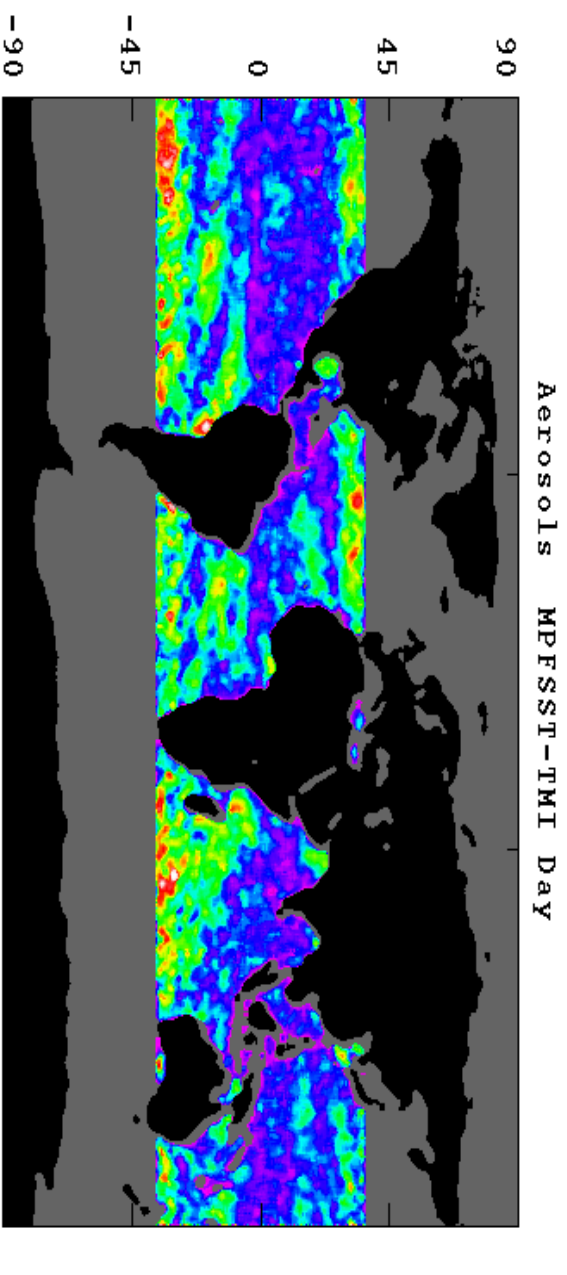
■ 30N to 40N

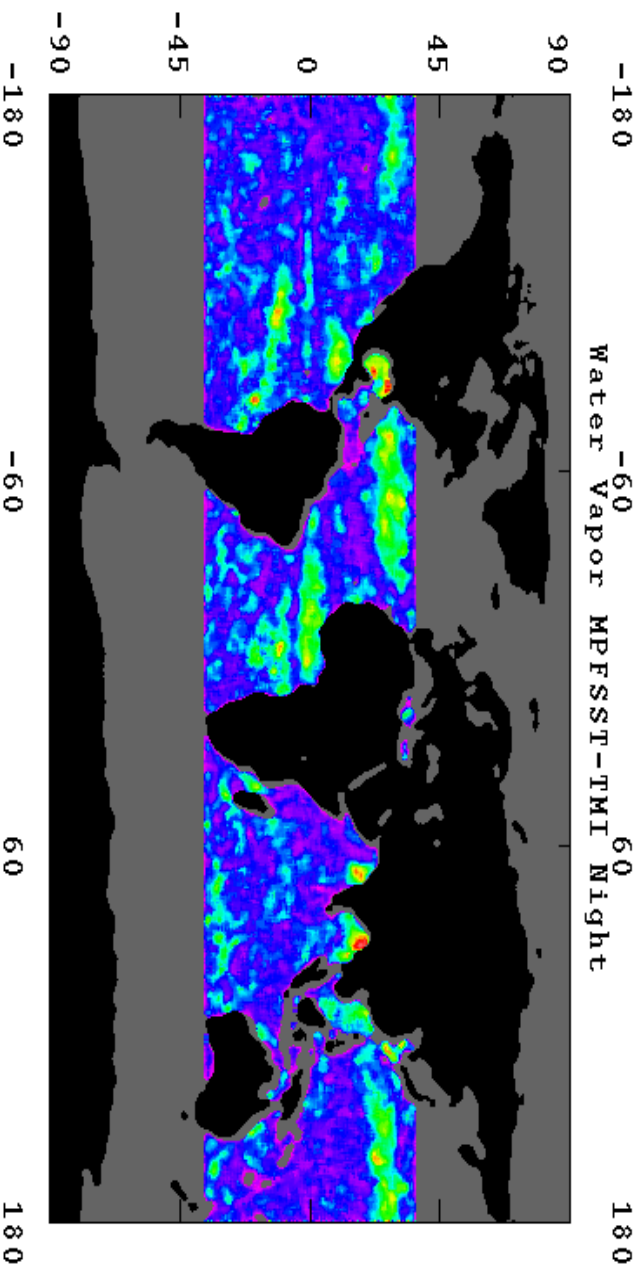
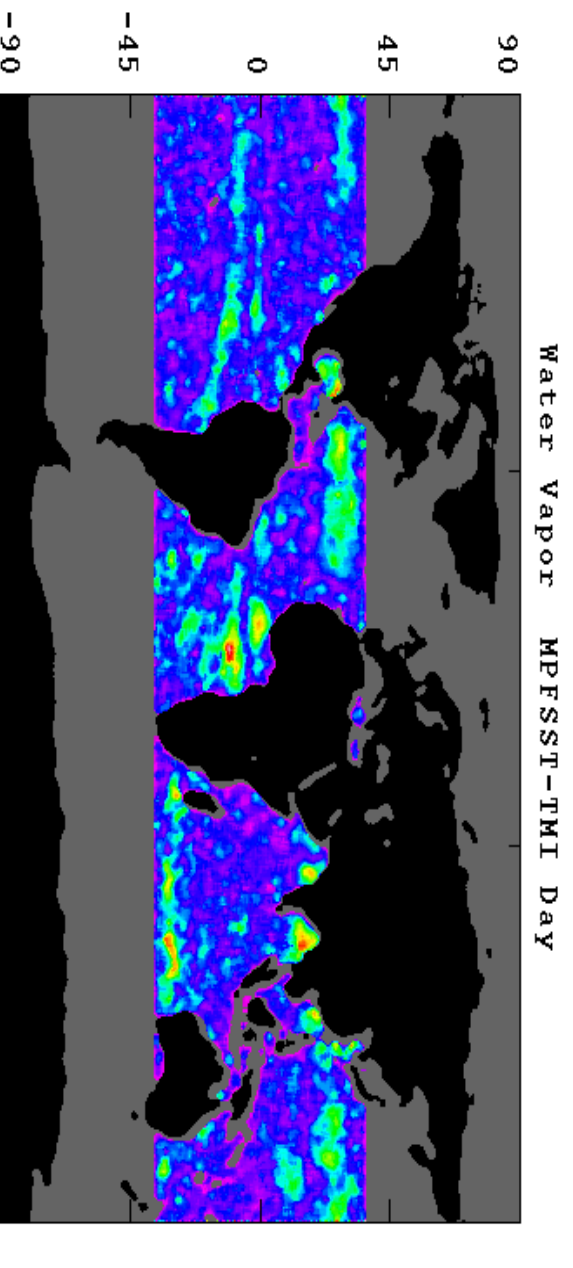
⊗ 0 to 30N



0.00 0.25 0.50
Multiple Correlation



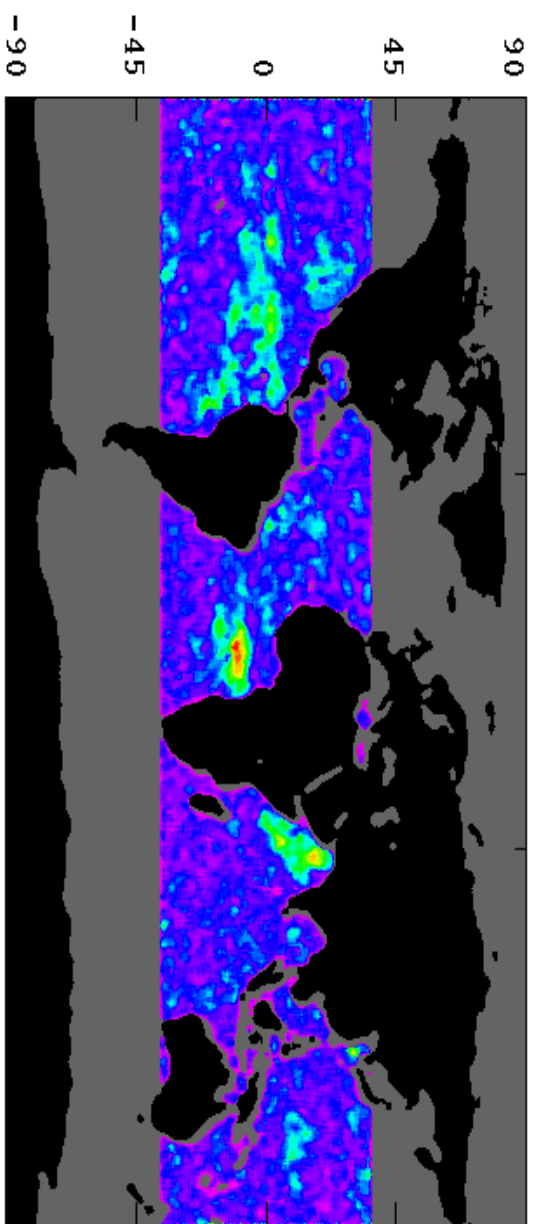




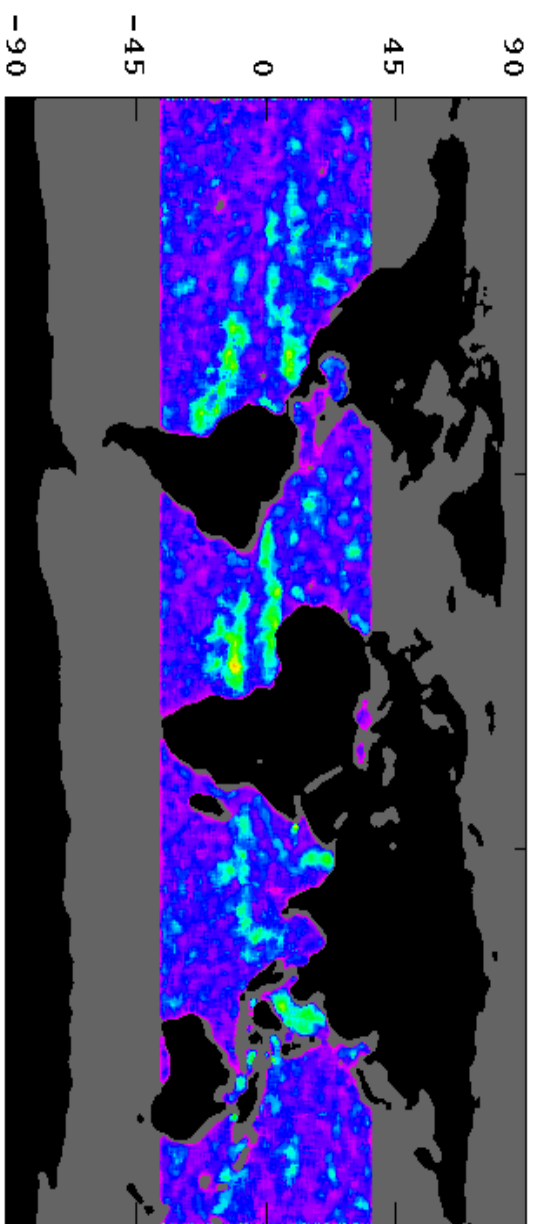
Partial Correlation

0.00 -60 0.25 60 0.50

Winds MPFSST-TMI Day

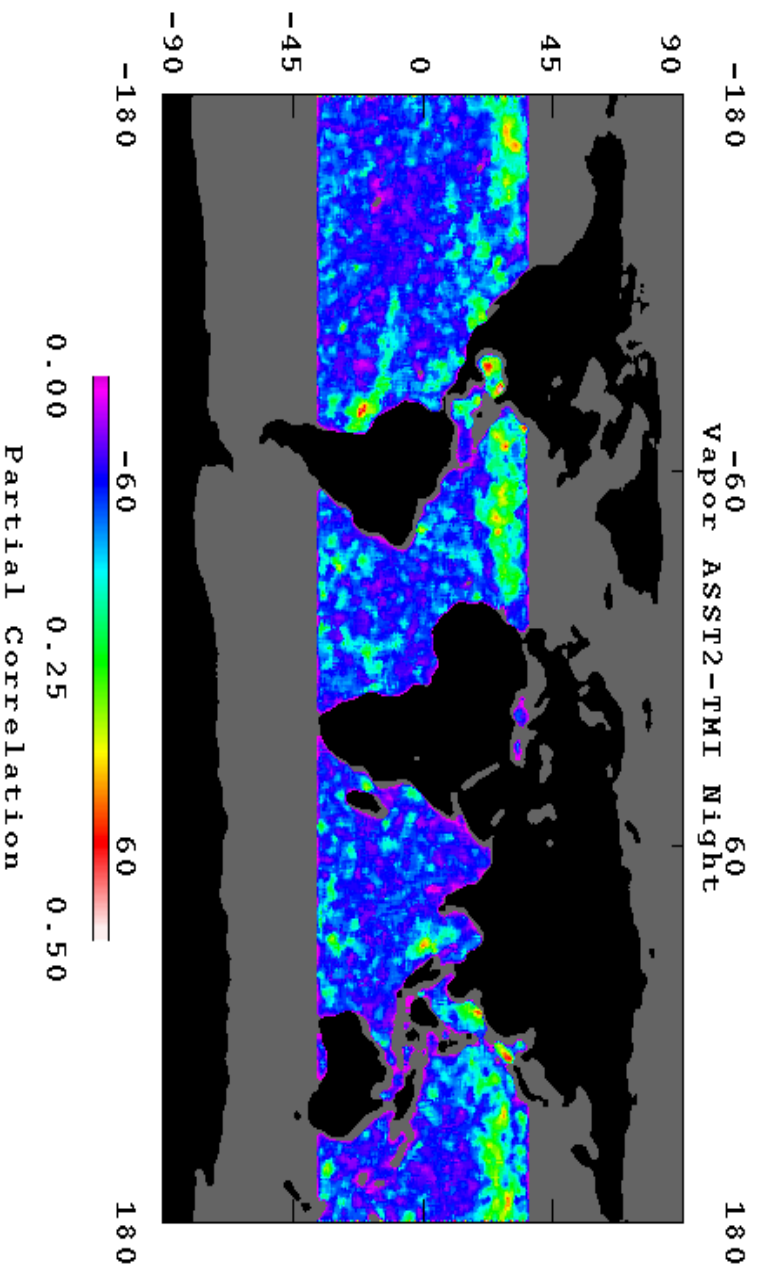
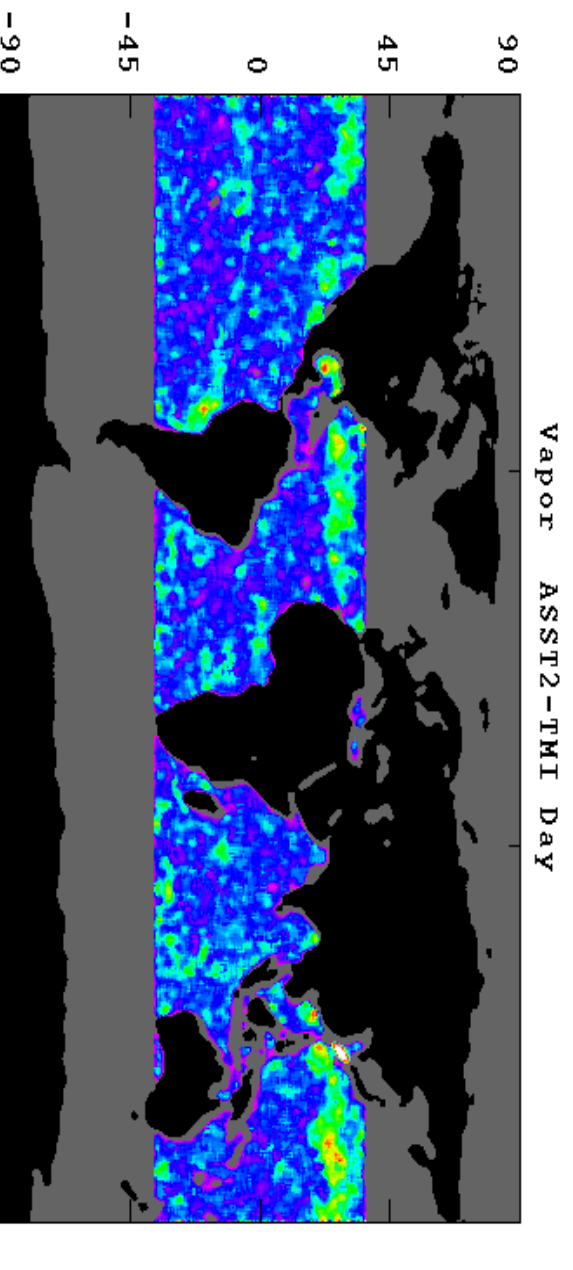


Winds MPFSST-TMI Nigh

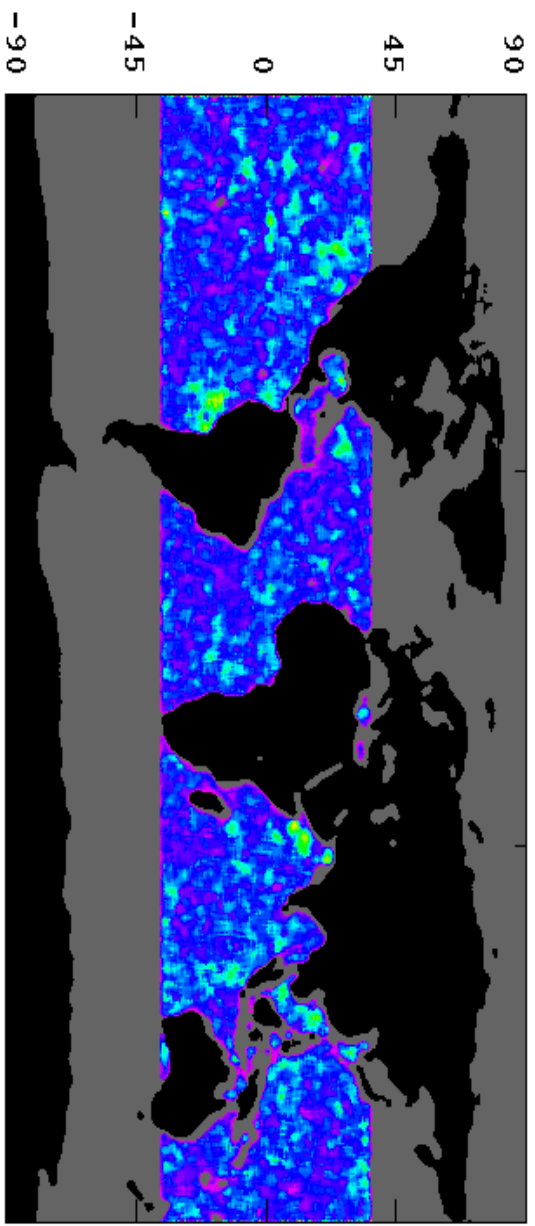


Partial Correlation

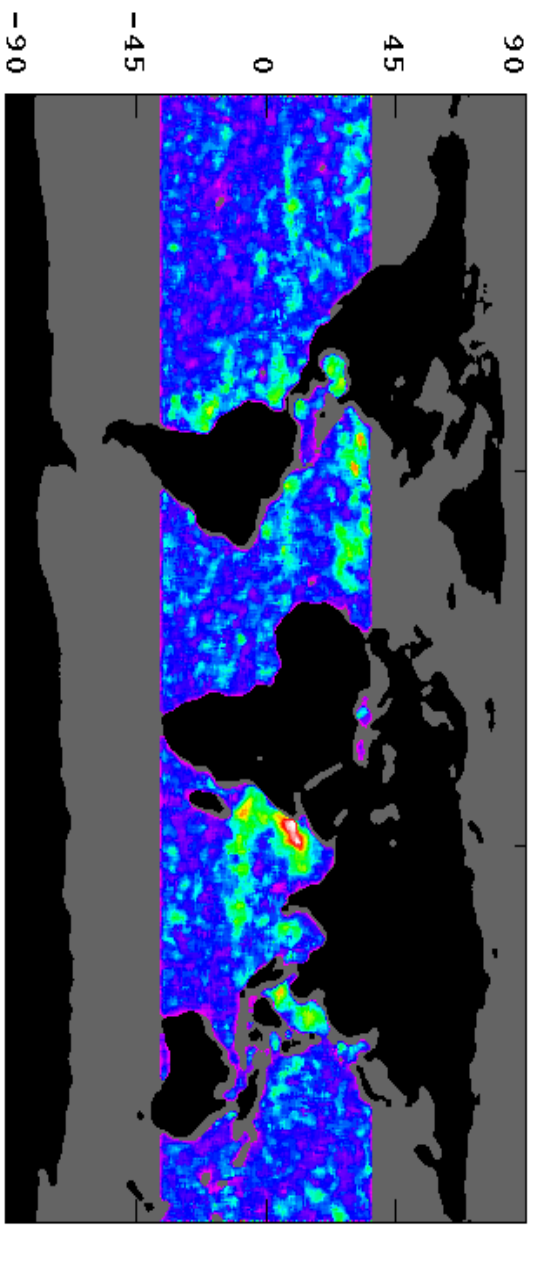
0.00 -0.60 0.25 0.50 60



Winds ASST2-TMI Day



Winds ASST2-TMI Night



Partial Correlation

0.00 -0.60 0.25 0.50 60

Conclusions

- Use of higher Pathfinder flags can significantly reduce biases
- Comparisons with the WOD02 confirm that the ATSR2 SSTs are performing better during times of high aerosols
- Future work needs to be done to fully understand the implications of correlations of winds and water vapor with MPFSST and ATSR2-TMI differences

