



Microwave Radiometer (MWR) L1B Brightness Temperatures

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2- Comisión Nacional de Actividades Espaciales

AQ Science Team Meeting

April 11, 2012

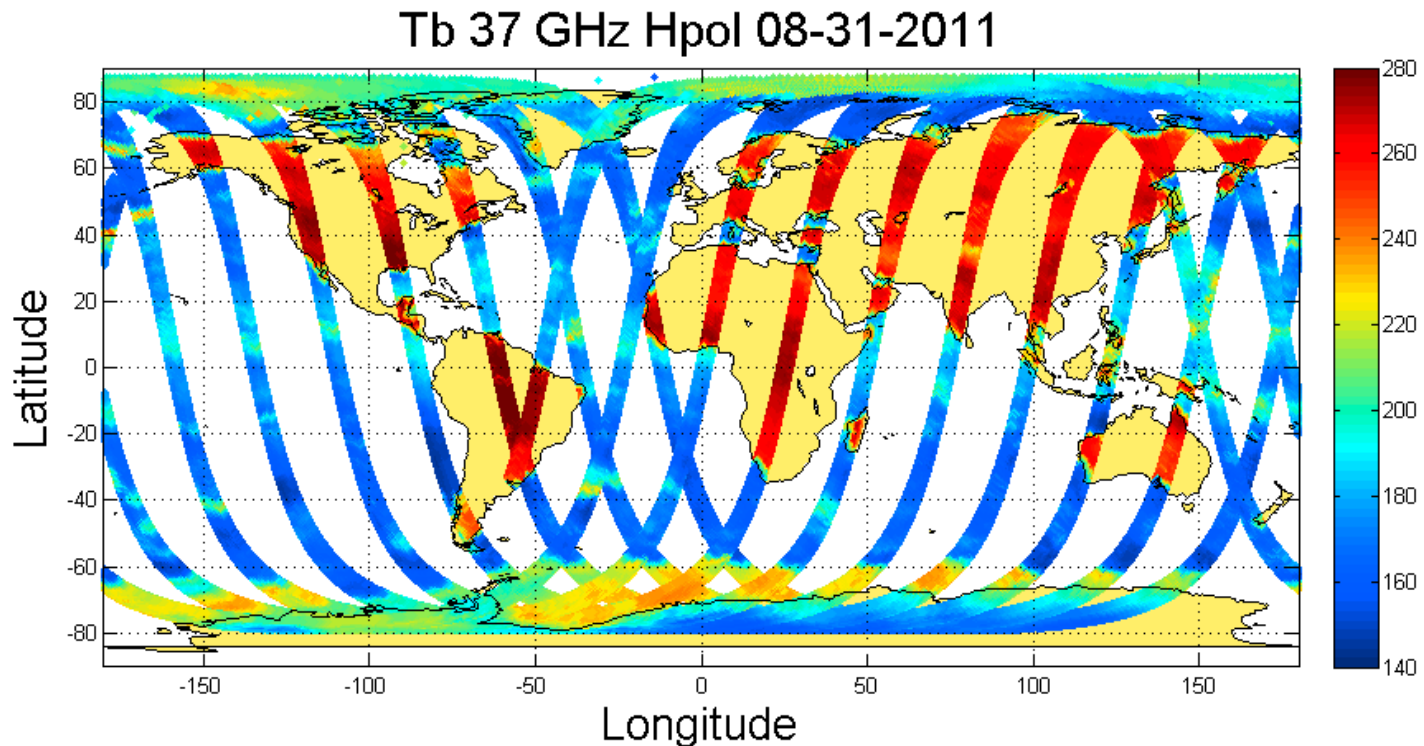
Buenos Aires, Argentina

MWR Counts to T_{ant} Algorithm Status



On-Orbit Check-out

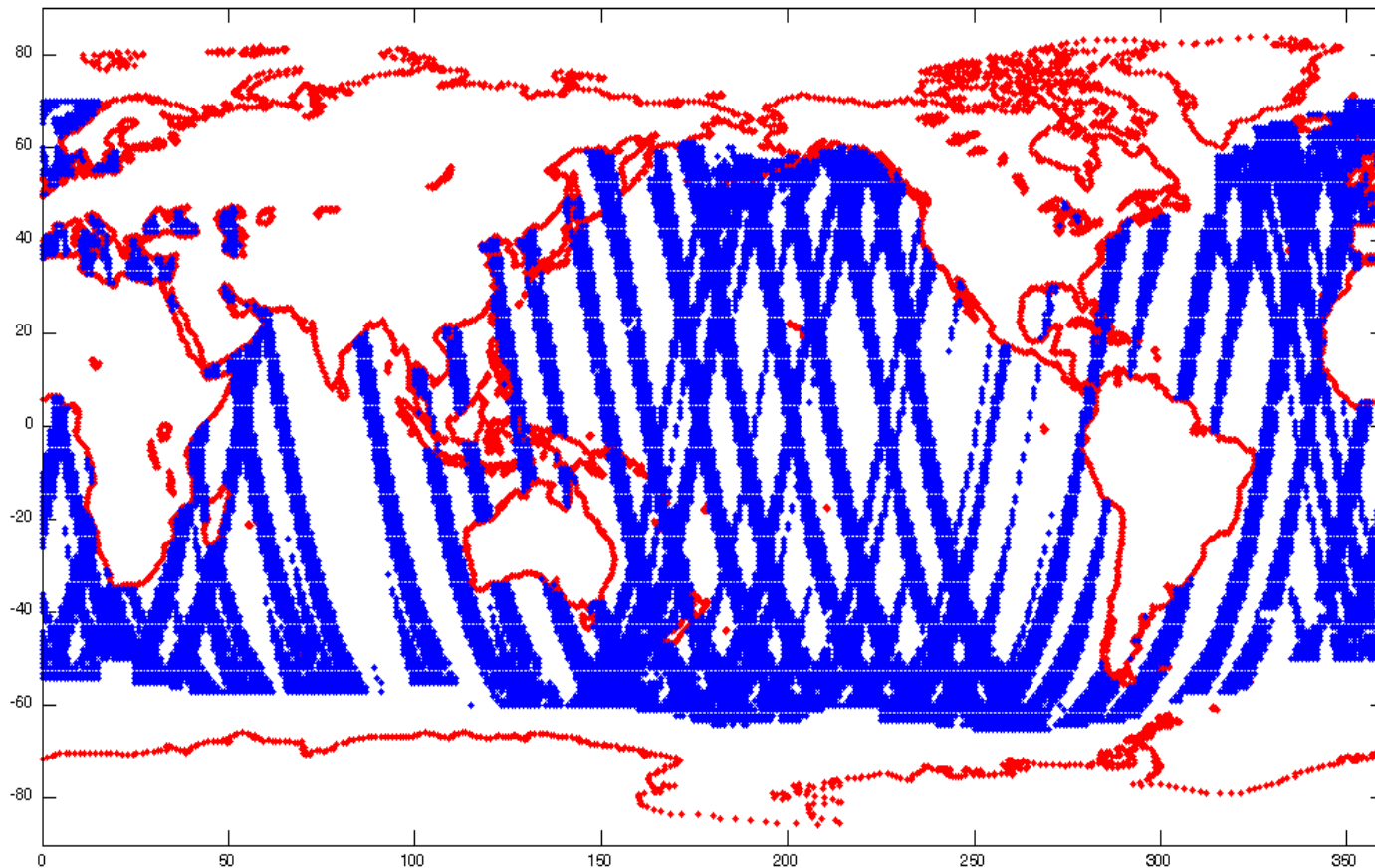
- MWR turned-on evening Aug 30th, 2011
- 1st T_{ant} images produced ~ 6 hours after data reception on Aug. 31st



MWR Counts to T_{ant} Algorithm Status



- Prelim inter-satellite calibration with WindSat completed on Sept 4th
 - 65 revs of MWR/Windsat Tb's

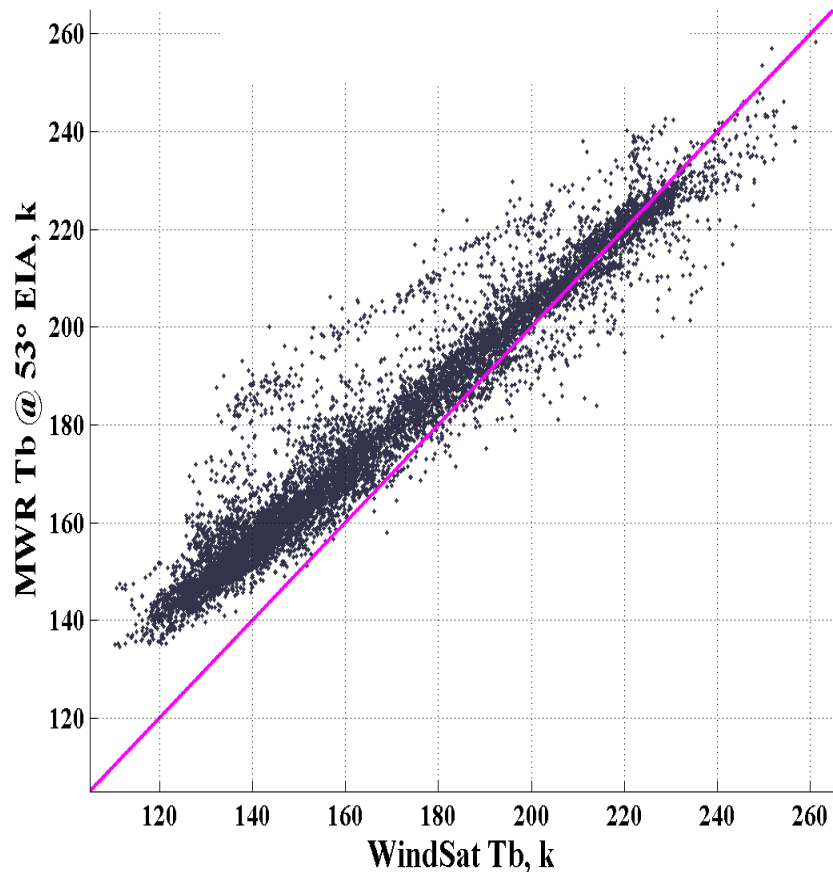


Example: Beam # 1, 23 GHz H-pol



Pre-Launch TV Calib

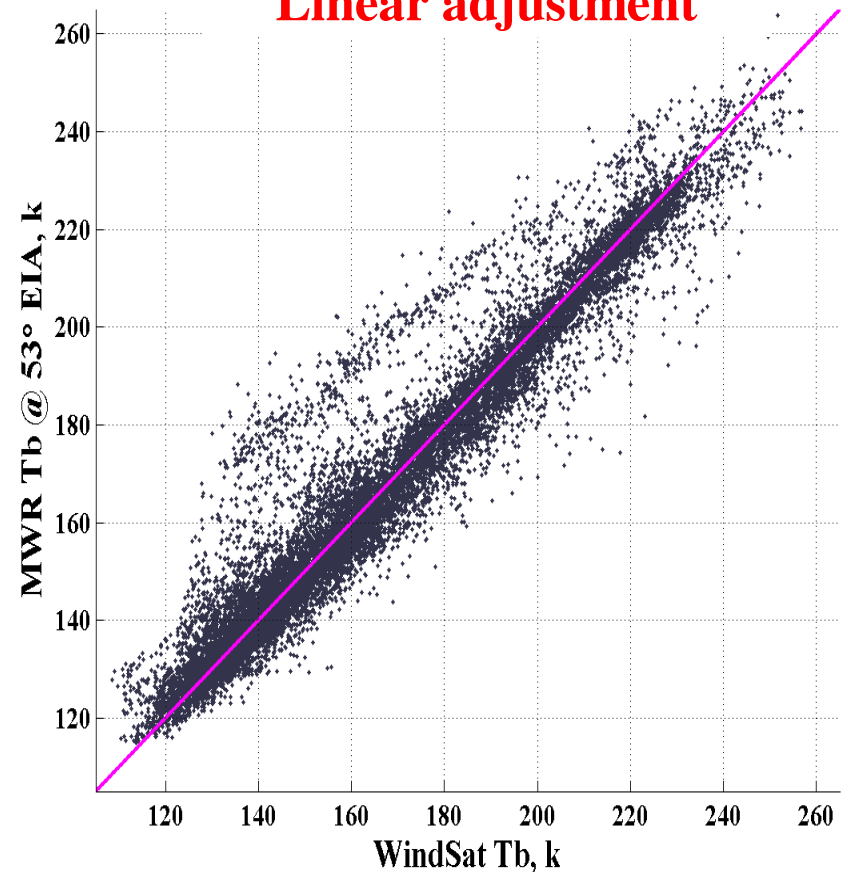
Tb v2.0



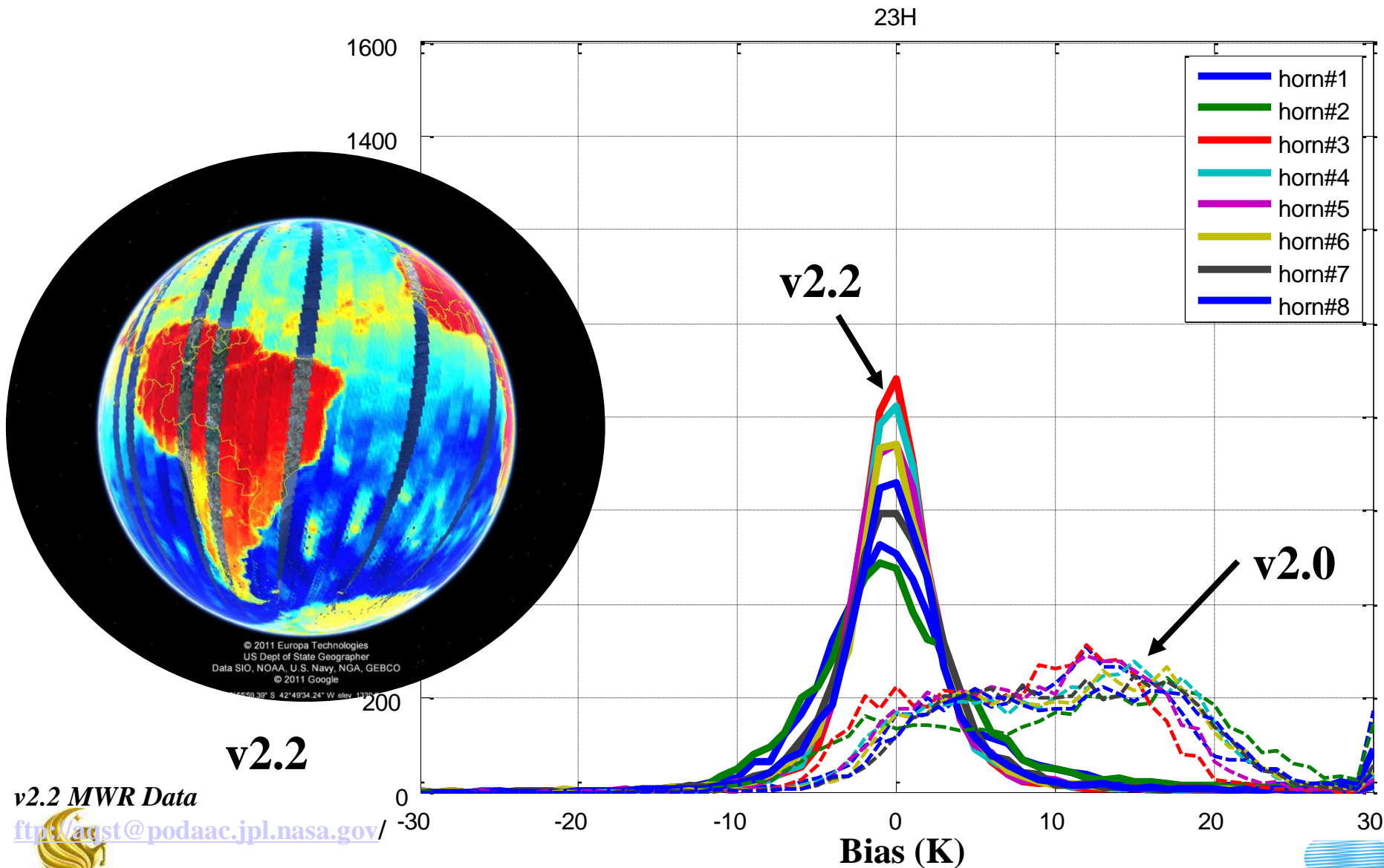
Post-Launch X-cal

Tb v2.1

Linear adjustment



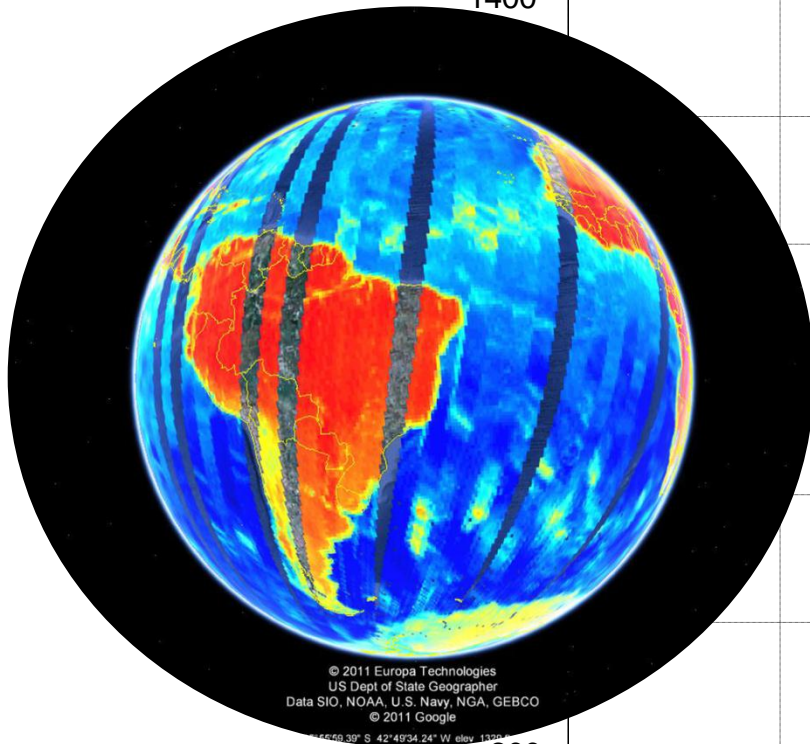
23.8 GHz H-pol Bias Histogram



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v2.2

36.5 GHz H-pol Bias Histogram

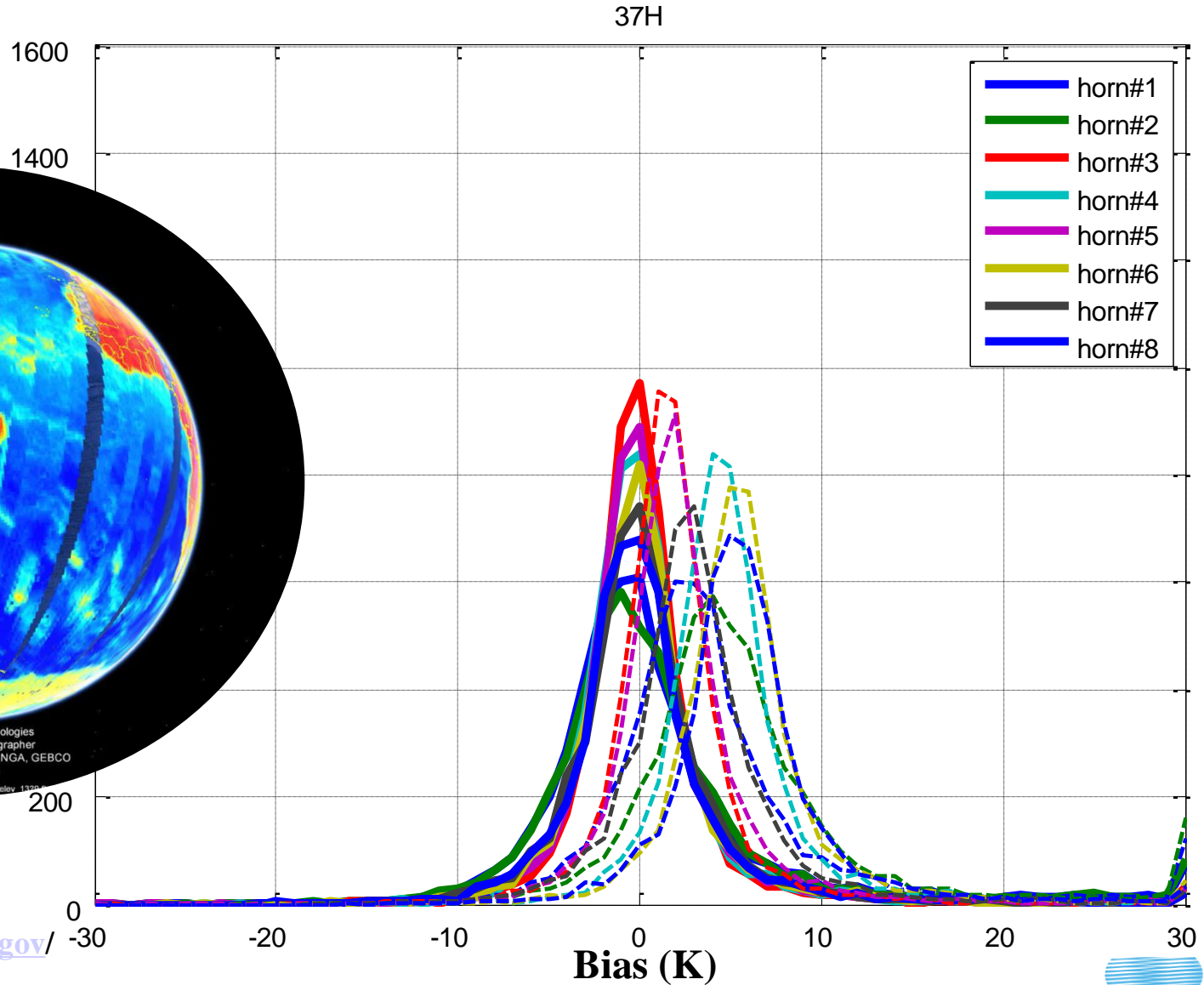


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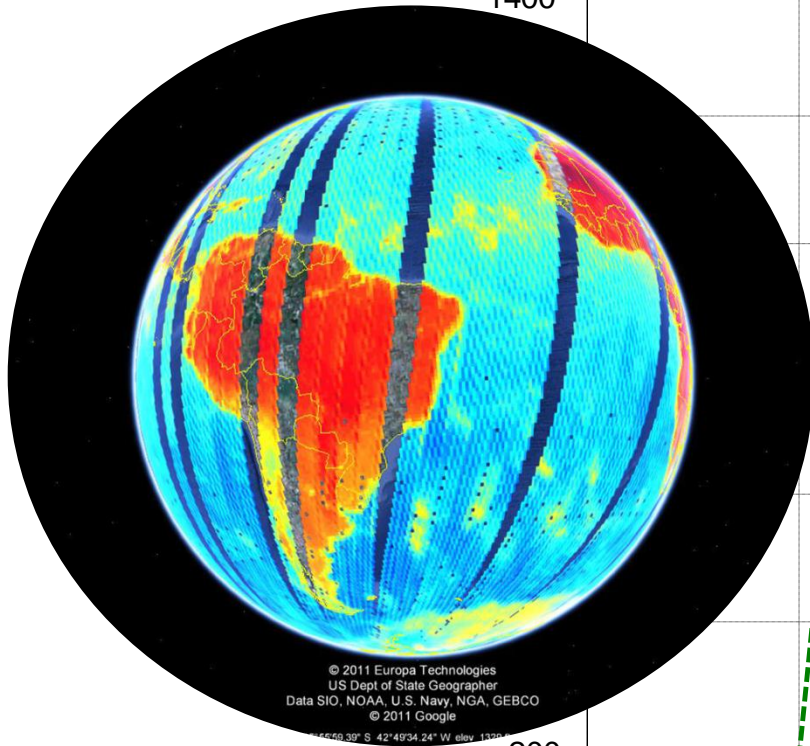
v2.2

v2.2 MWR Data

<ftp://gust@podaac.jpl.nasa.gov/>

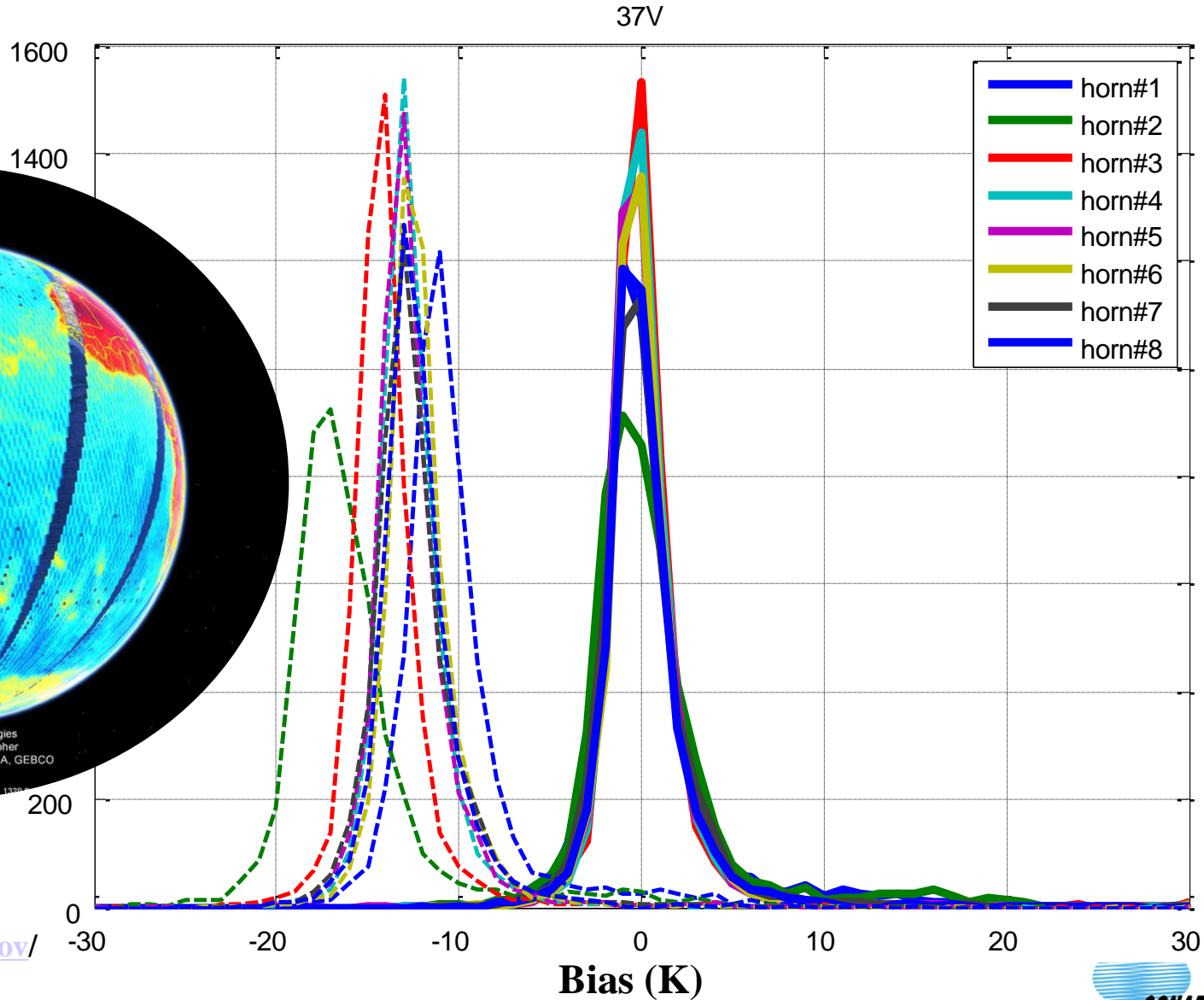


36.5 GHz V-pol Bias Histogram



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v2.2



v2.2 MWR Data

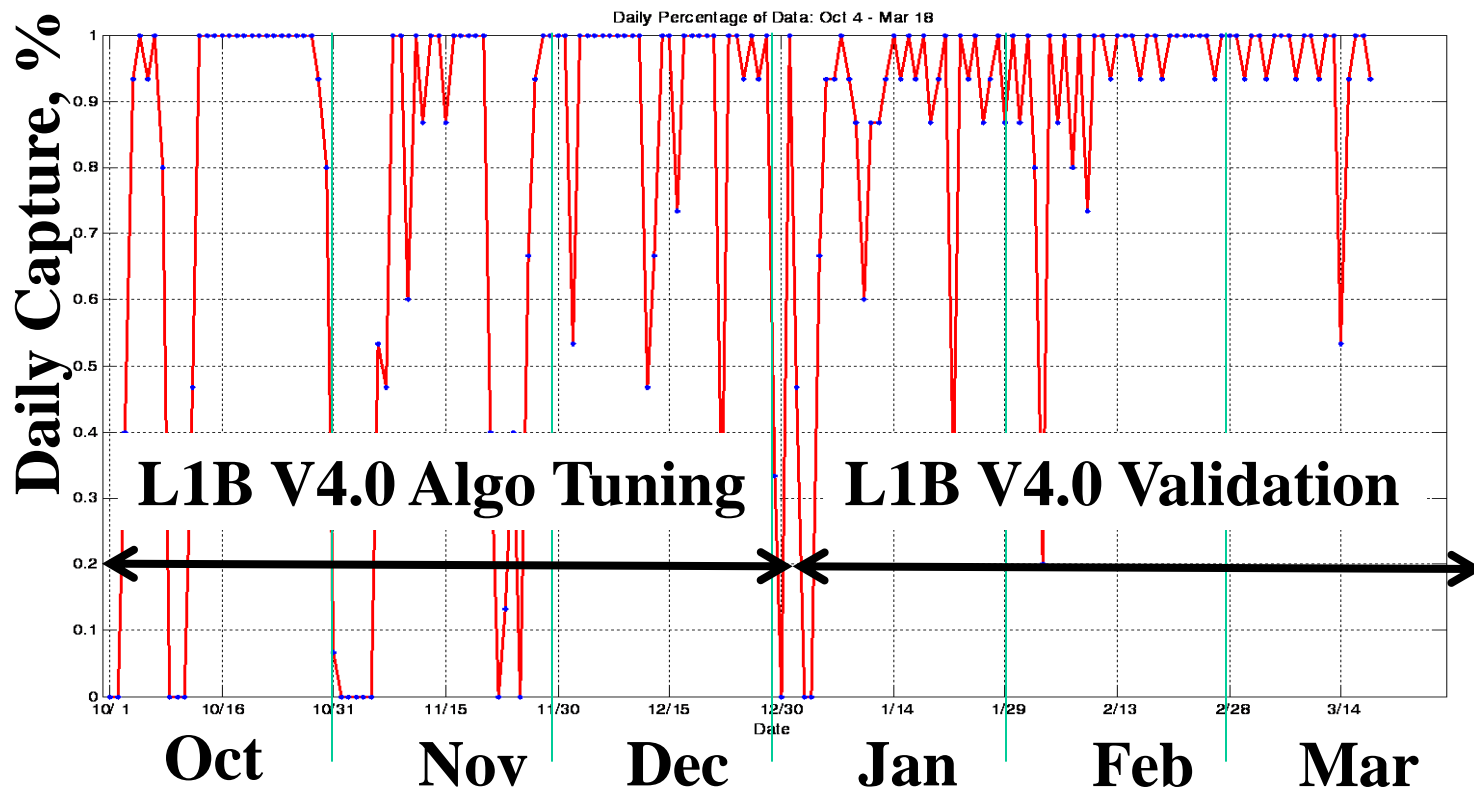
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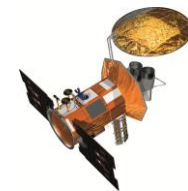
PAD Reset Impact on MWR Data



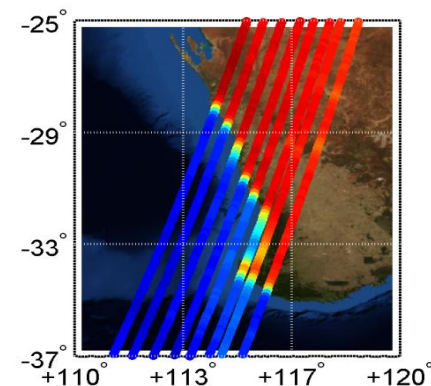
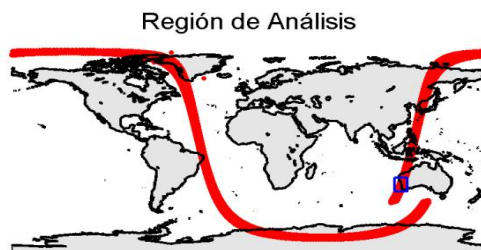
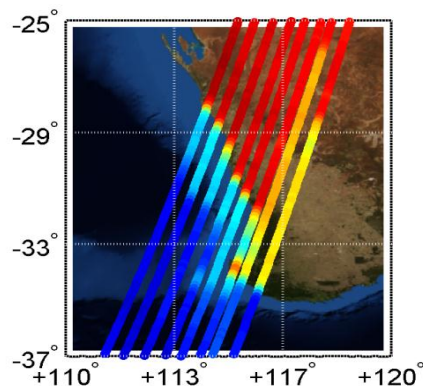
- The “PAD-reset” issue had serious impact on MWR data capture in Sept, 2011
 - Operational work-arounds permitted routine science data collection on Oct 4th



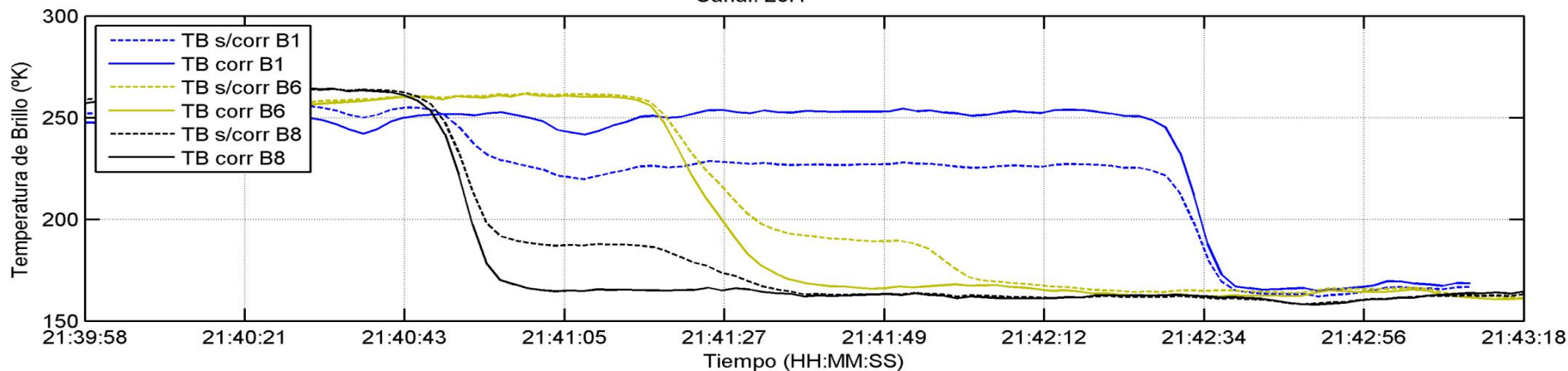
MWR Tb Smear Issue



- A T_{ant} anomaly was discovered that corrupts MWR observations at strong-contrast scenes (e.g., land/water)
 - Cause is unknown but a correction algorithm has been developed

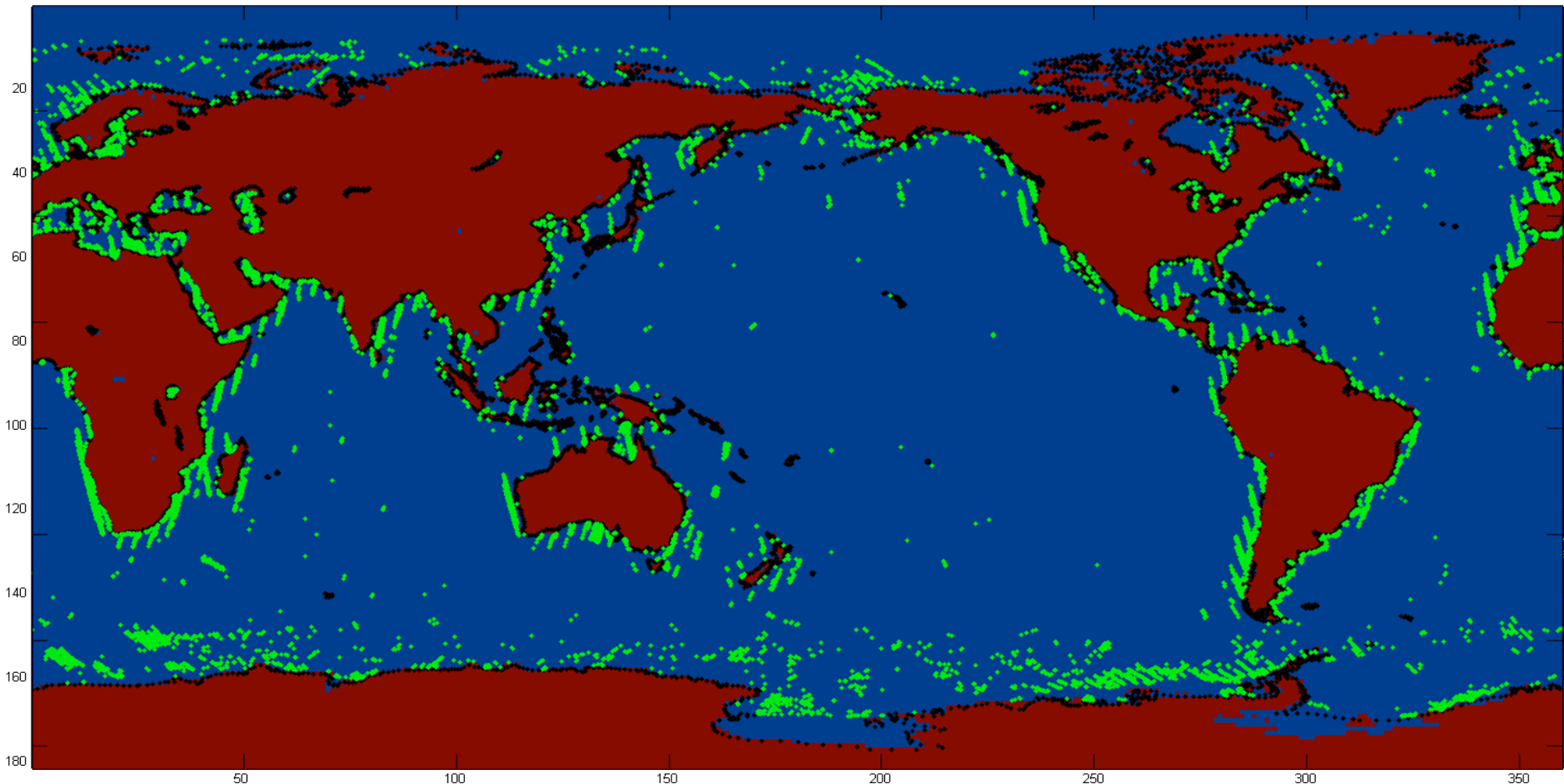


Canal: 23H



Smear Corruption Present in MWR Tb Calib.

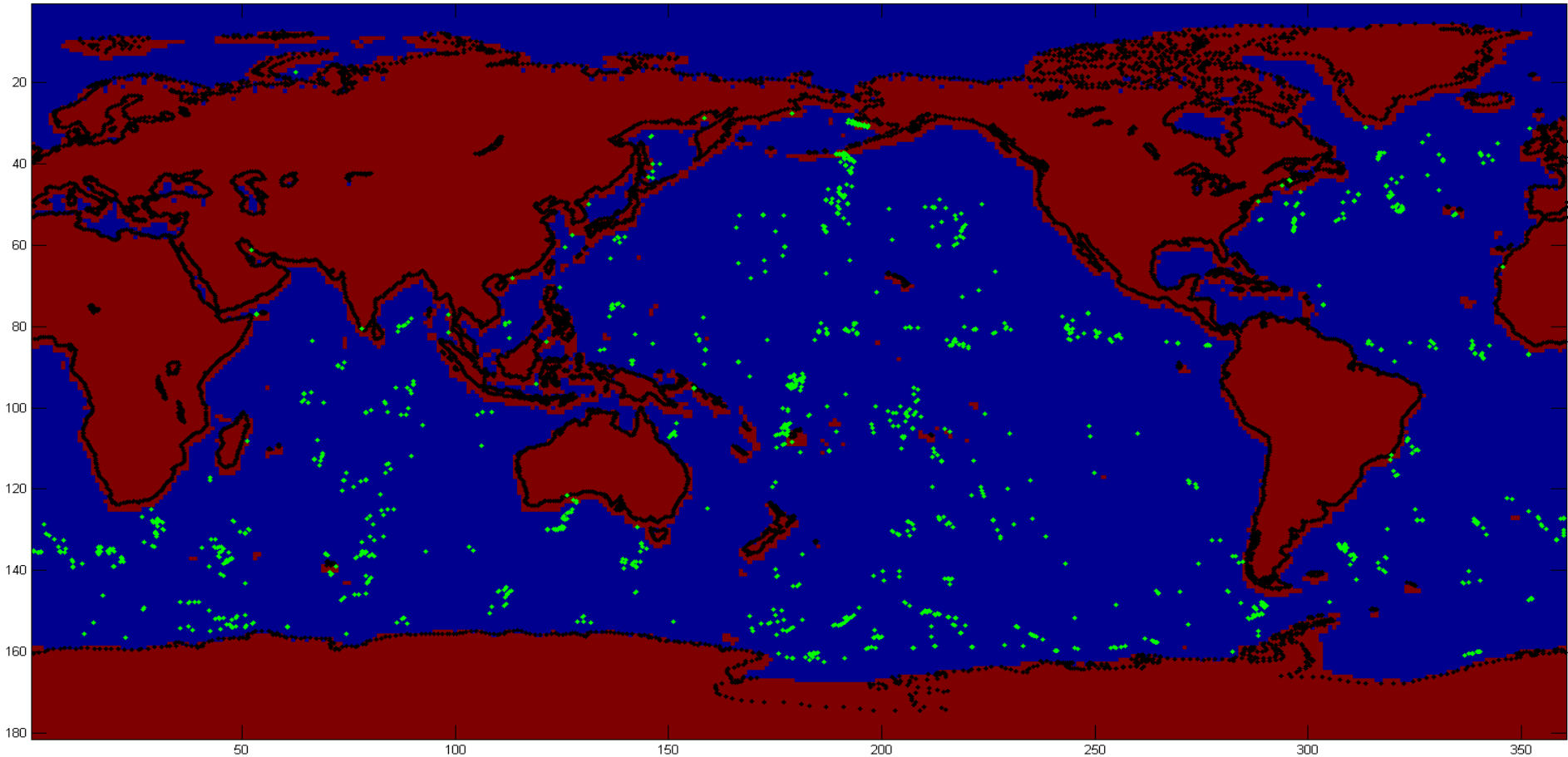
- MWR T_{ant} data tuned to Windsat to produce L1B V4.0 were corrupted with “smear effect”



MWR/WindSat Inter-Sat Comparisons



- MWR “smear-corrected” T_{ant} are significantly improved



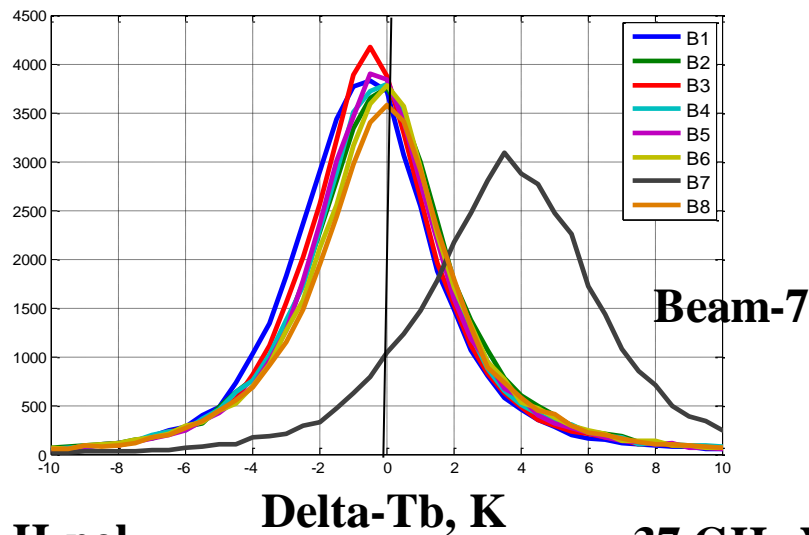
MWR/WindSat Inter-Sat Comparisons



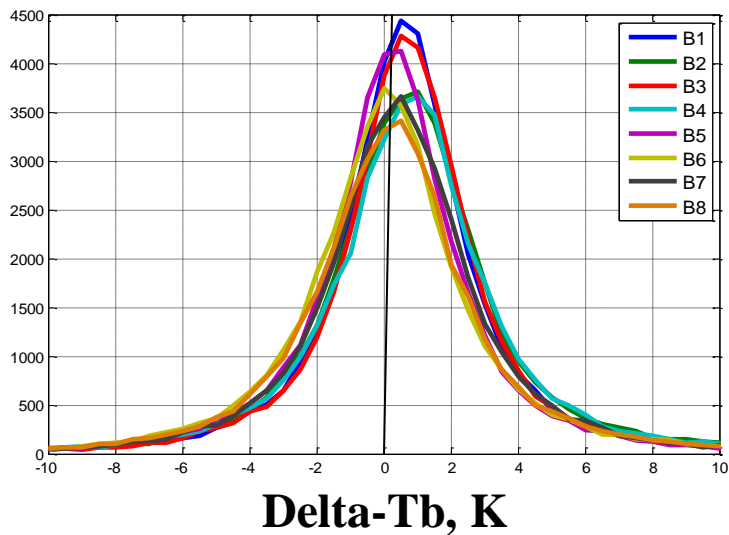
- MWR “smear-corrected” T_{ant} have been tuned to WindSat to produce L1B V5.0 algorithm
 - For period Oct through Dec, 2011
- MWR L1B V5.0 algorithm validation using WindSat for Jan through March 2012
 - Results are significantly improved for all channels except 23 H beam-7
 - Anomaly investigation in progress

MWR V5 T_{ant} / WindSat Inter-Comparisons

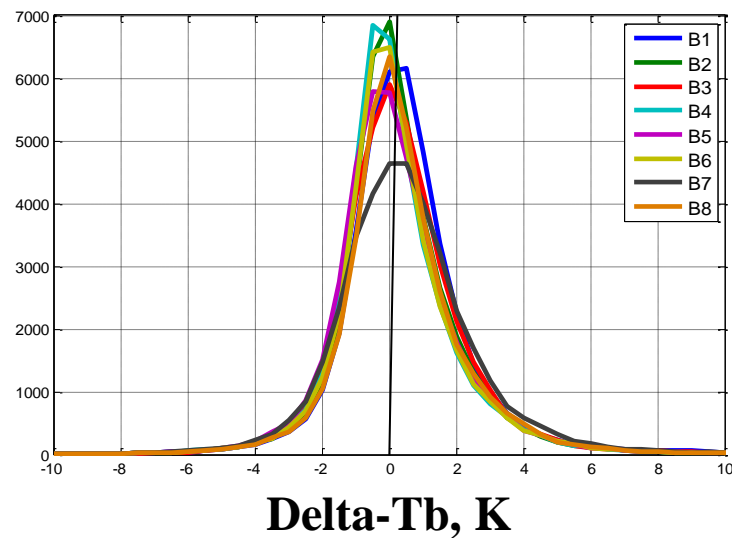
23 GHz H-pol



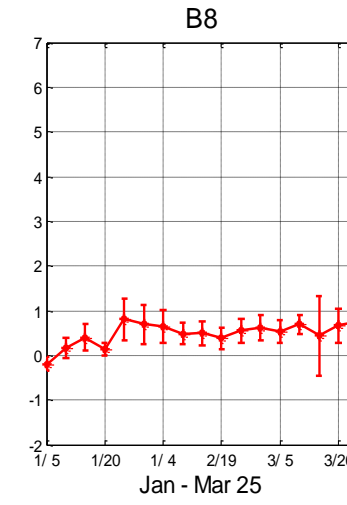
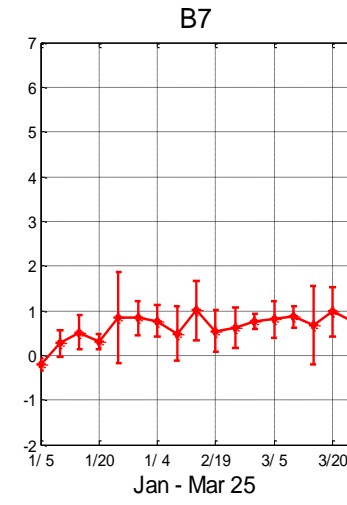
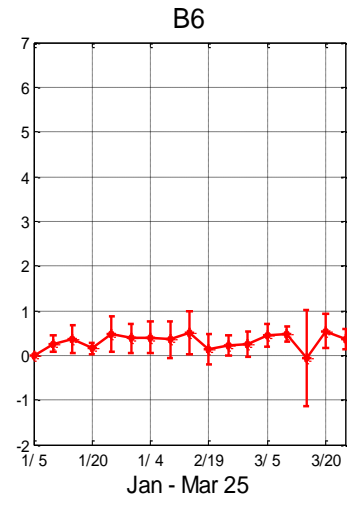
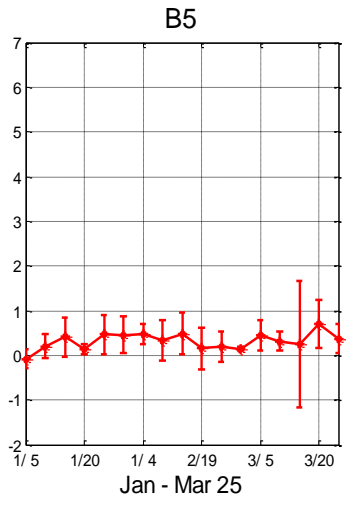
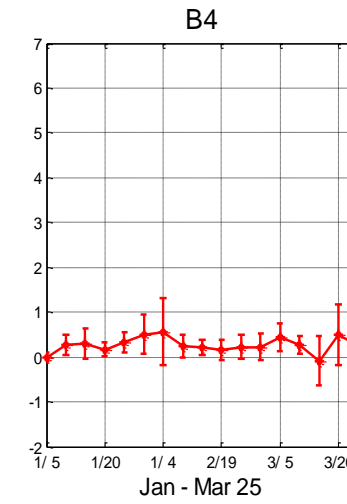
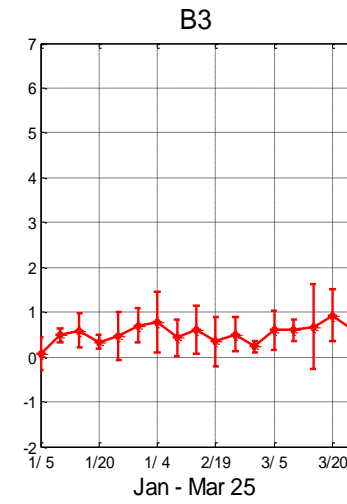
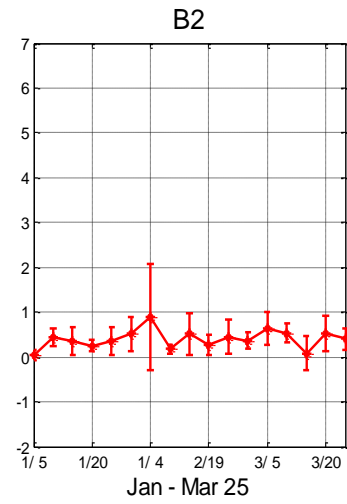
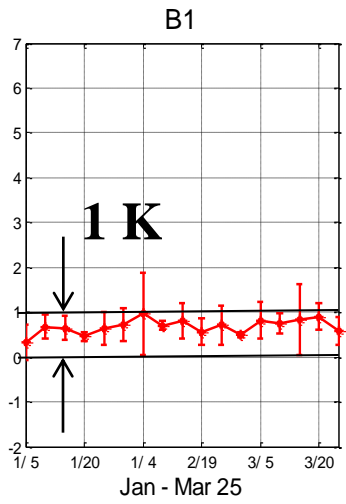
37 GHz H-pol



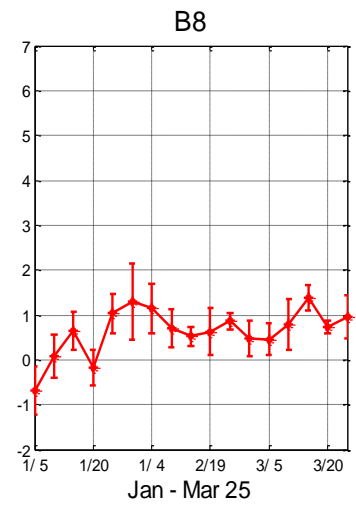
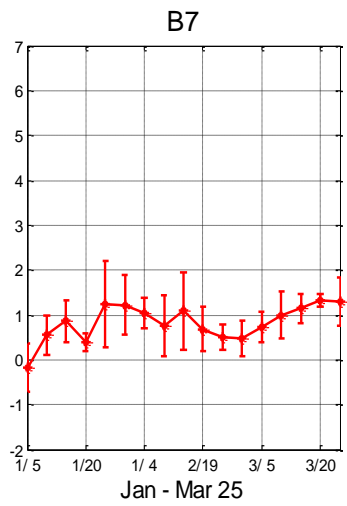
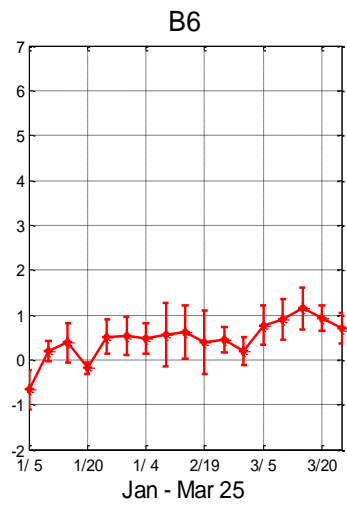
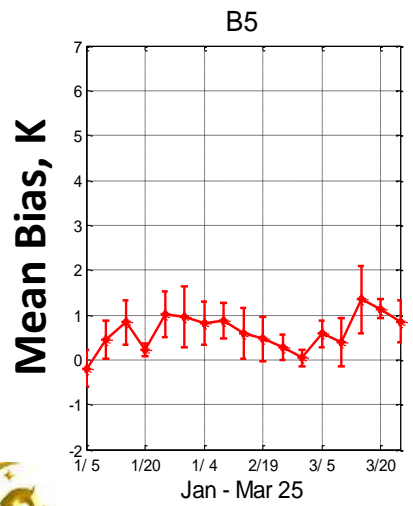
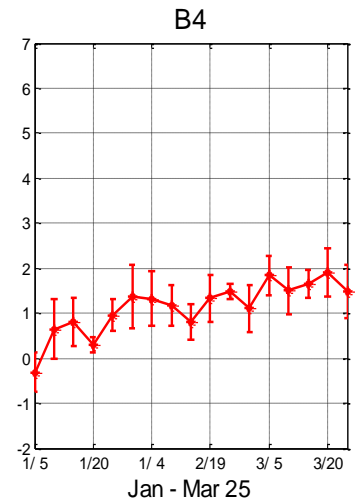
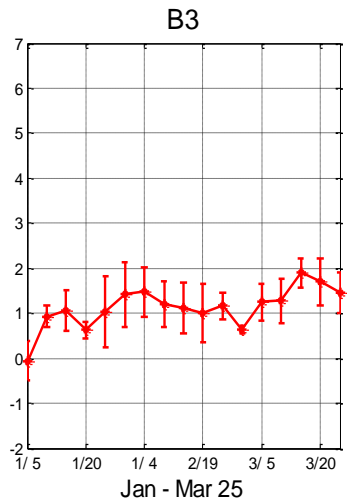
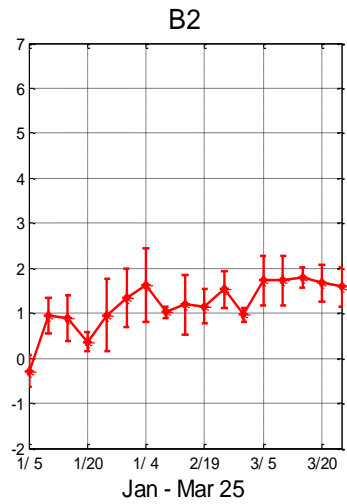
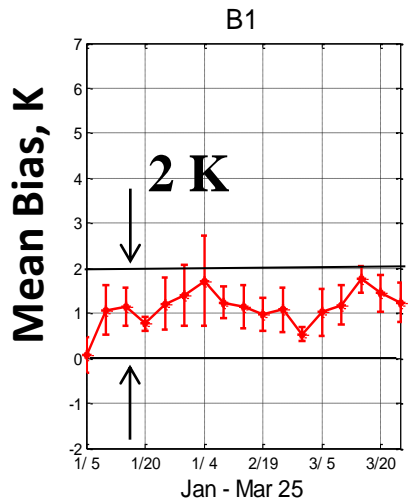
37 GHz V-pol



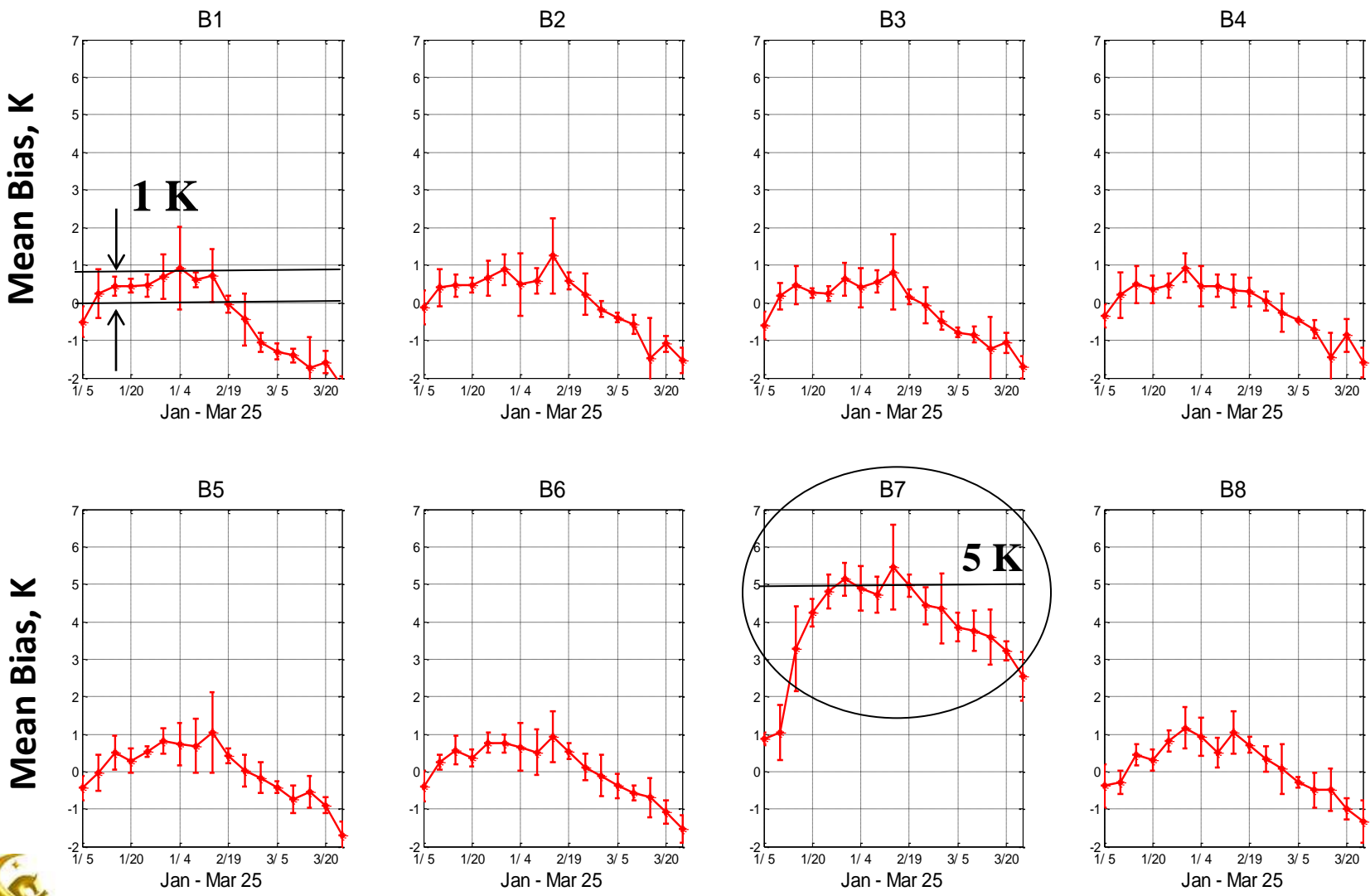
MWR V5/WindSat 37V GHz Biases (5 day average)



MWR V5/WindSat 37H GHz Biases (5 day average)



MWR V5/WindSat 23H GHz Biases (5 day average)



L1B T_{ant} Algo Summary



- Preliminary MWR L1B V4.0 have been released to AQ Cal/Val team in Dec 2011
- Geophysical algorithm using V4.0 have produced reasonable results (see posters Friday morning)
- MWR “smear-effect” discovered and empirical correction algorithm developed
- MWR L1B V5.0 algorithm has been tuned to WindSat using “smear-corrected” T_{ant}
 - Currently undergoing evaluation
 - L1B V5.0 data to be released to AQ Cal/Val team in May 2012