GPM X-Cal Update

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GMI Calibration Updates

- GSICS presentation from May 2015 showed a new APC for GMI
- X-Cal analyzed latest GMI calibration and showed results at June 2015 meeting
- The updated GMI data will be available sometime this fall

GMI Inter-Cal: New Calibration vs. Current Version (from last GSICS meeting)

GMI – WindSat

	10v	10h	18v	18h	23v	36v	36h
Current DD	2.84	1.54	2.73	0.03	0.00	-1.52	-1.56
New Cal DD	1.14	0.57	-0.55	-1.92	-1.06	-1.40	-1.48
Diff	1.70	0.97	3.28	1.95	-1.06	-0.12	-0.08

GMI – MetOp-B MHS

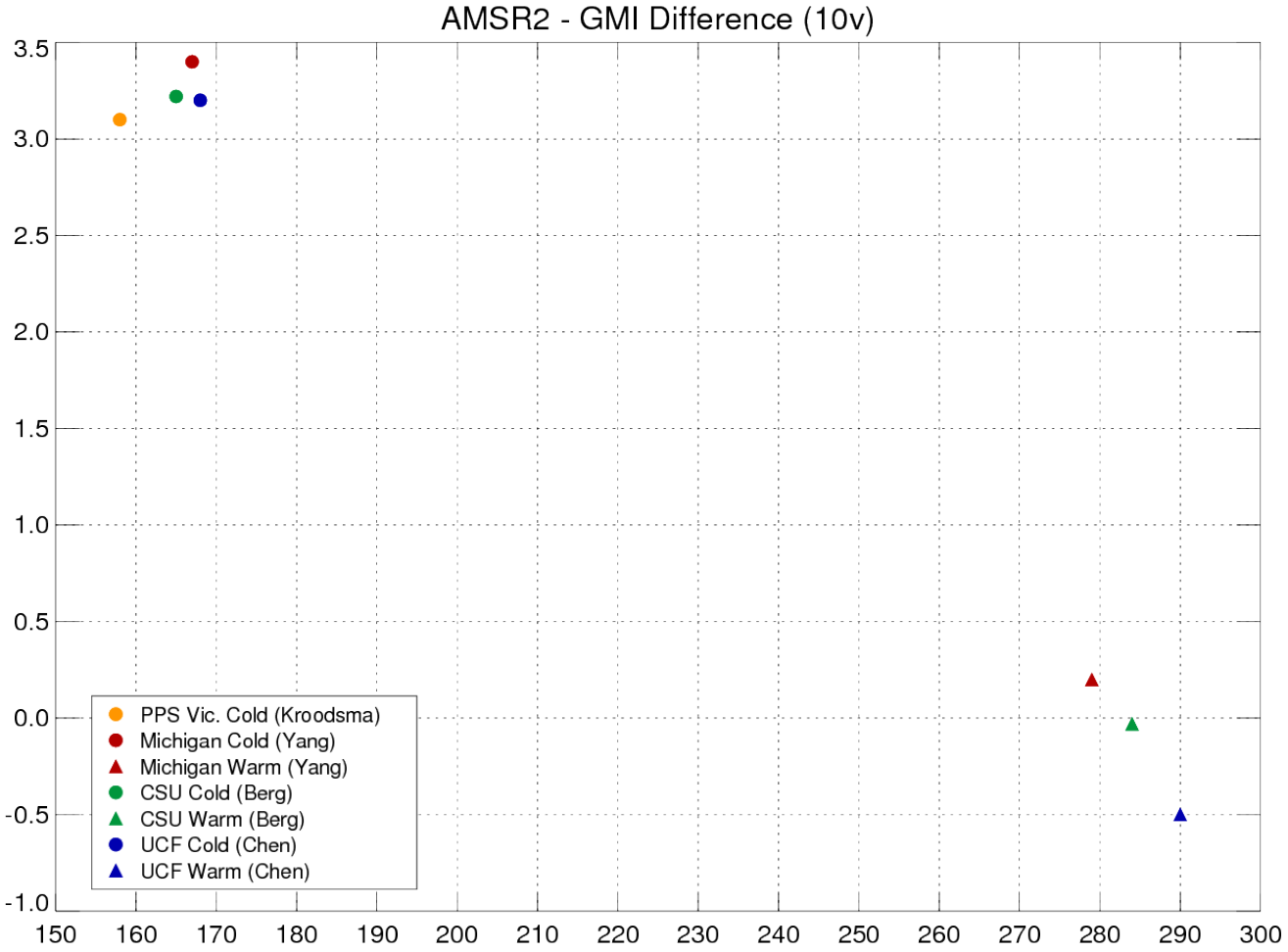
	89v	89h	166v	166h	183+/-3	183+/-7
Current DD	0.07	1.07	-3.21	-2.96	-2.18	-2.51
New Cal DD	-0.22	1.04	-0.10	0.18	0.30	-0.34
Diff	0.29	0.03	-3.11	-3.14	-2.48	-2.17

Numbers courtesy of Tom Wilheit

Recent X-Cal Activities

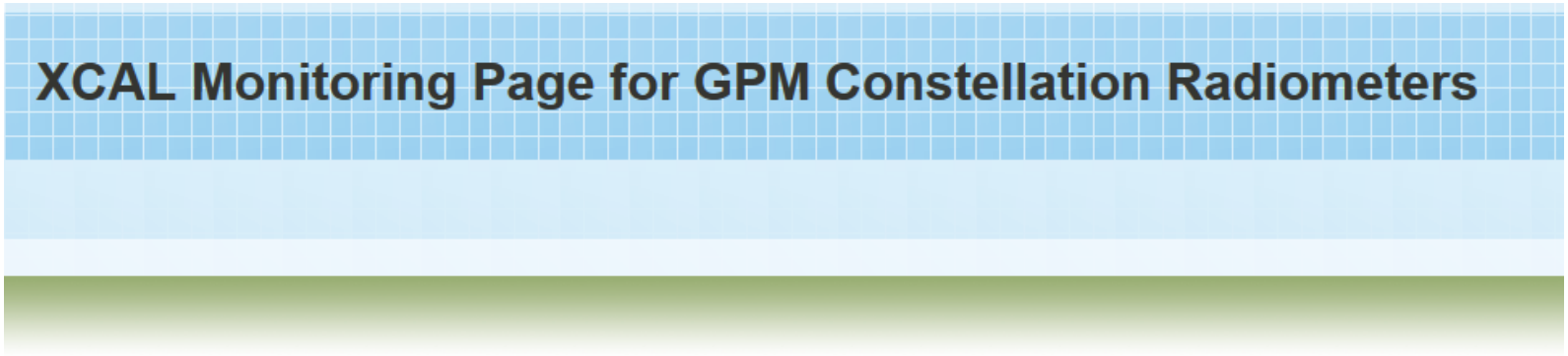
- Delivered new inter-calibration constants relative to GMI for all radiometers in the constellation
  - Reprocessing radiometer data starting March 2014
  - TMI (through April 2015), AMSR2, SSMIS F16, F17, F18, F19 (starting Dec 2014)
  - MHS Metop-A, Metop-B, NOAA18, NOAA19, ATMS, SAPHIR

Example X-Cal Results: AMSR2 10v



X-Cal Monitoring Page

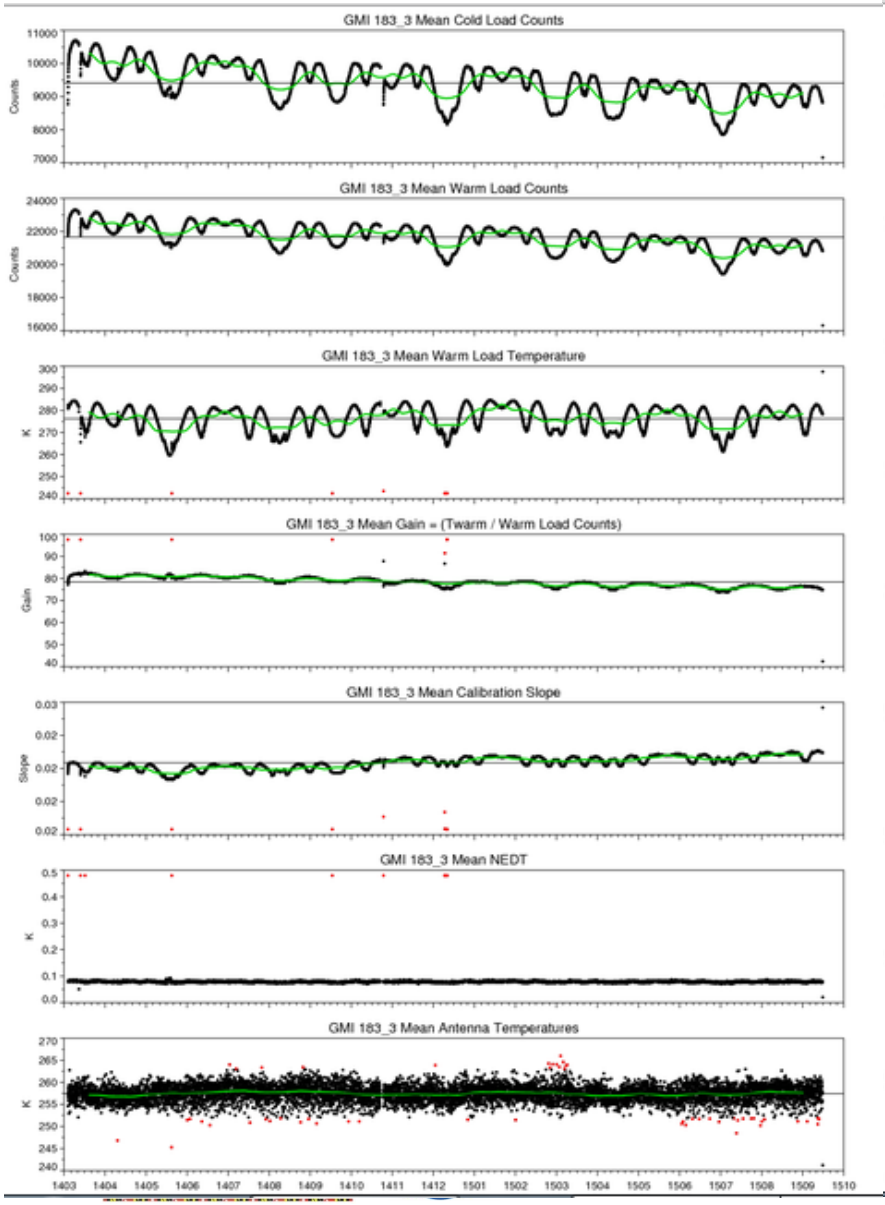
http://rain.atmos.colostate.edu/XCAL/

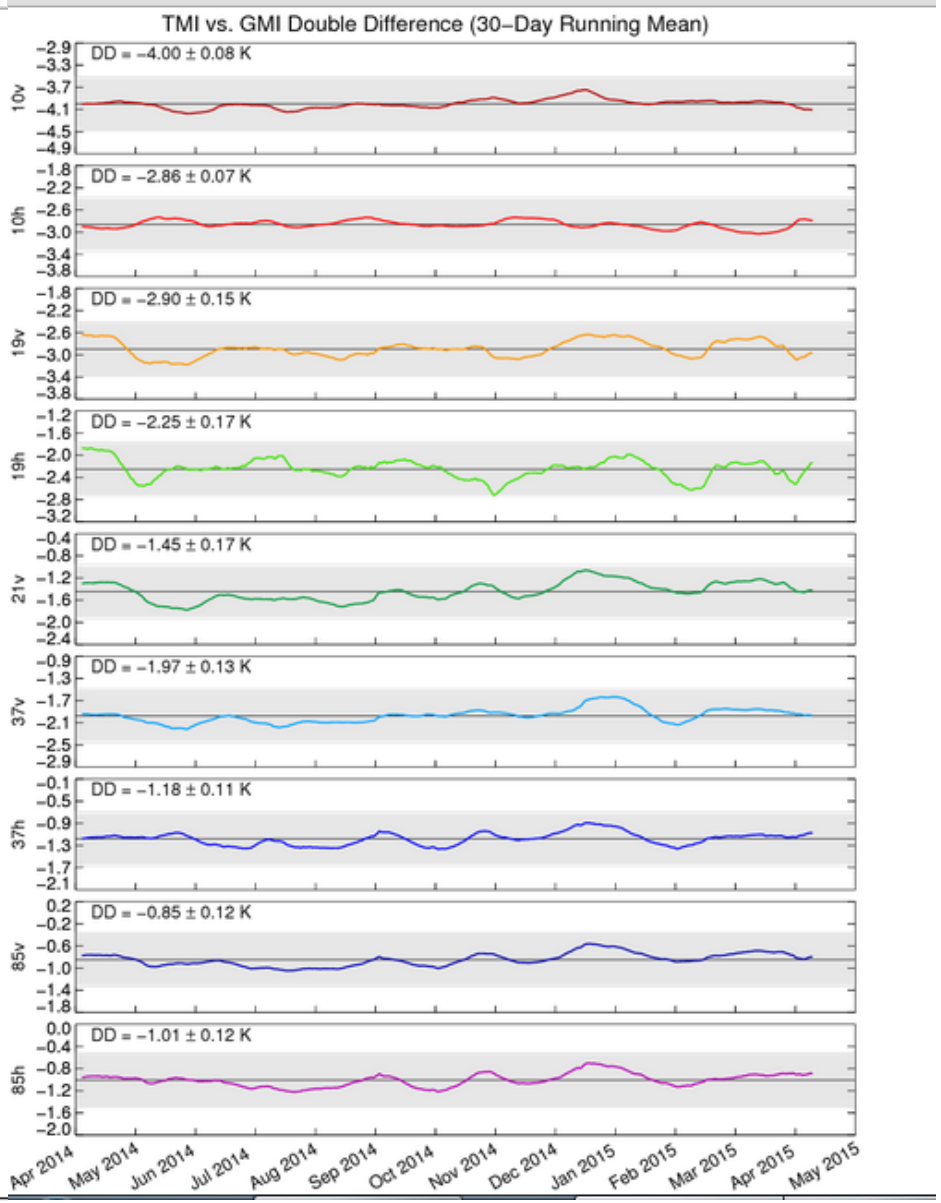


Monitoring of Level1 and Level2 Products

- 1Base Counts, Temps, NEDT: Time series of orbit mean values of antenna temperatures, cold and warm counts, warm load temps, gain, slope, and NEDT values for each channel from the 1Base files
- 1C Tb Double Differences: Time series of 30-day running mean double differences of constellation Tb values versus GPM GMI from the 1C files
- 2A Precipitation Estimates: Time series of daily mean precipitation estimates over tropical oceans from the 2A files

X-Cal Monitoring Page





Future Plans (next year or two)

- Reprocessing of all microwave radiometers back to 1997 (TRMM era)
  - AMSU, AMSR-E, all TMI, SSM/I and SSMIS back to 1997
  - TMI will be updated to V8
- X-Cal transition: Wes Berg replacing Tom Wilheit
  - Wilheit semi-retiring

GMI Calibration References

D. W. Draper, D. A. Newell, F. J. Wentz, S. Krimchansky, and G. M. Skofronick-Jackson, "The Global Precipitation Measurement (GPM) Microwave Imager (GMI): Instrument overview and early on-orbit performance," *IEEE J. Sel.Topics App. Earth Observ. Rem. Sens.*, vol. 8, no. 7, pp. 3452-3462, July 2015.

D. W. Draper, D. A. Newell, D. S. McKague, and J. R. Piepmeier, "Assessing calibration stability using the Global Precipitation Measurement (GPM) Microwave Imager (GMI) noise diodes," *IEEE J. Sel.Topics App. Earth Observ. Rem. Sens.*, 2015.

T. Wilheit et al., "Intercalibrating the GPM constellation using the GPM microwave imager (GMI)," IGARSS, Milan, Italy, 27-31 July 2015.

D. Newell et al., "GPM microwave imager (GMI) on-orbit performance and calibration results," IGARSS, Milan, Italy, 27-31 July 2015.