



RHUBC-II Breakout Session

Overview of AERI and REFIR-PAD

Dave Tobin, Dave Turner, Bob Knuteson, Denny Hackel

University of Wisconsin – Madison

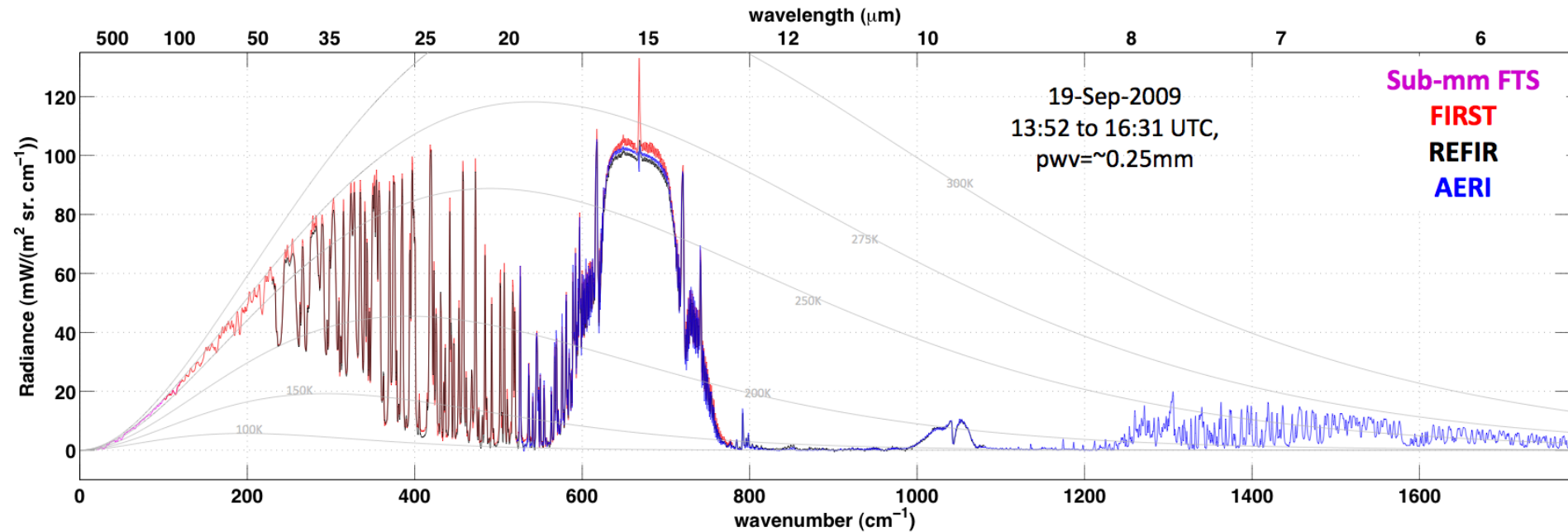
Luca Palchetti, Giovanni Bianchini

Institute of Applied Physics “Nello Carrara”, IFAC – CNR

2010 ASR Meeting

Full Infrared Spectrum

Example RHUBC-II Clear Sky Downwelling Radiance Observations



AERI

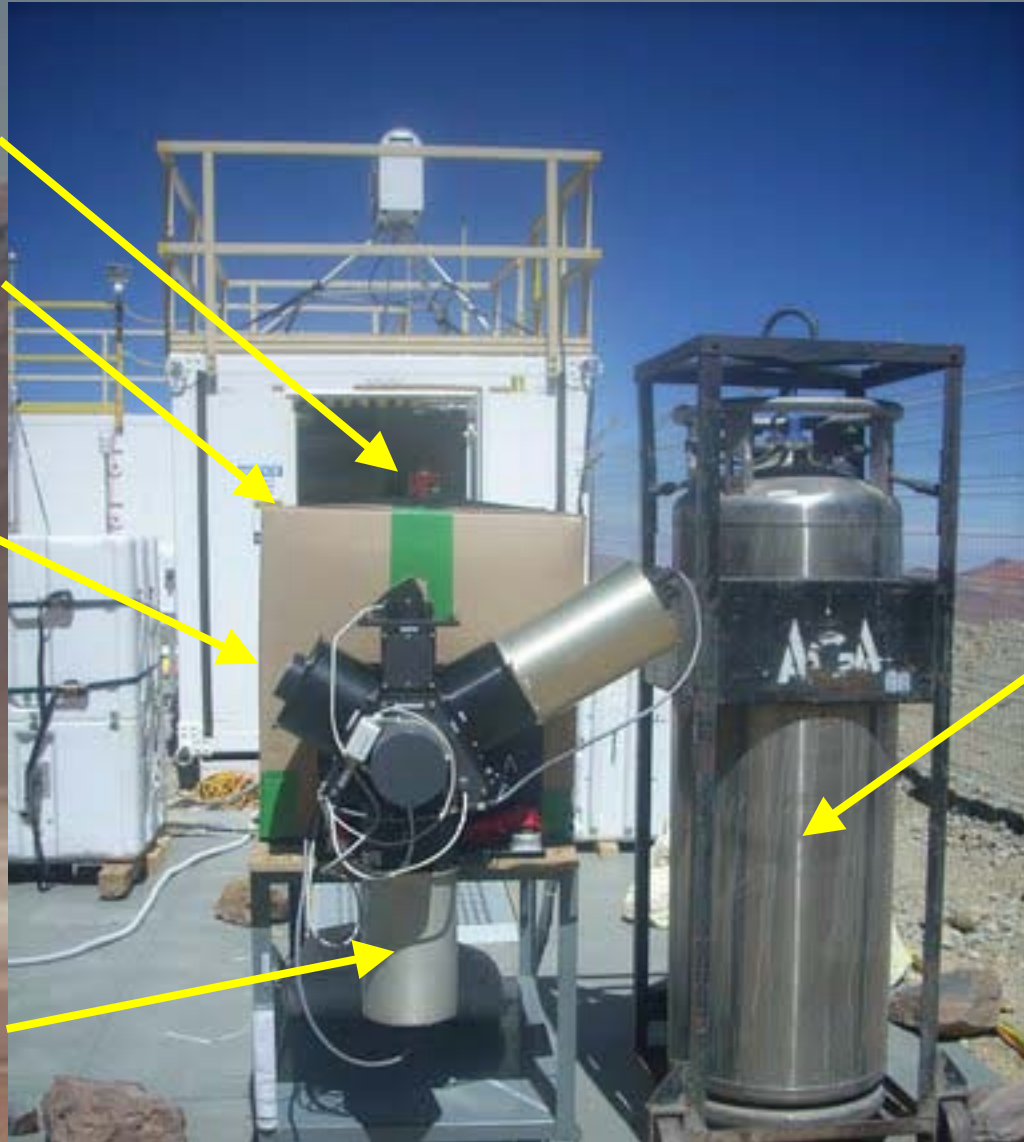
LN₂ dewar

New insulating box

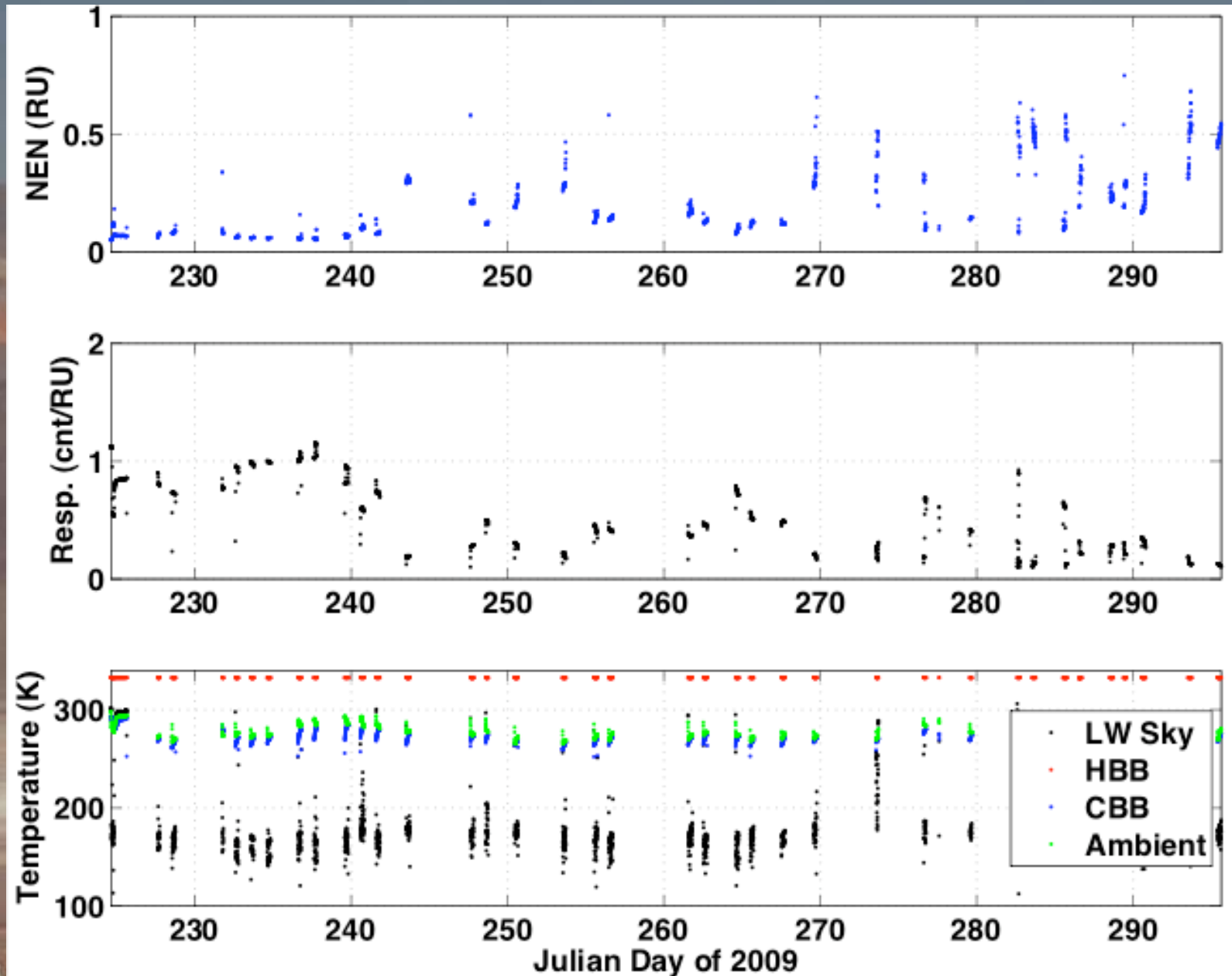
2nd FOV

ABB in nadir position

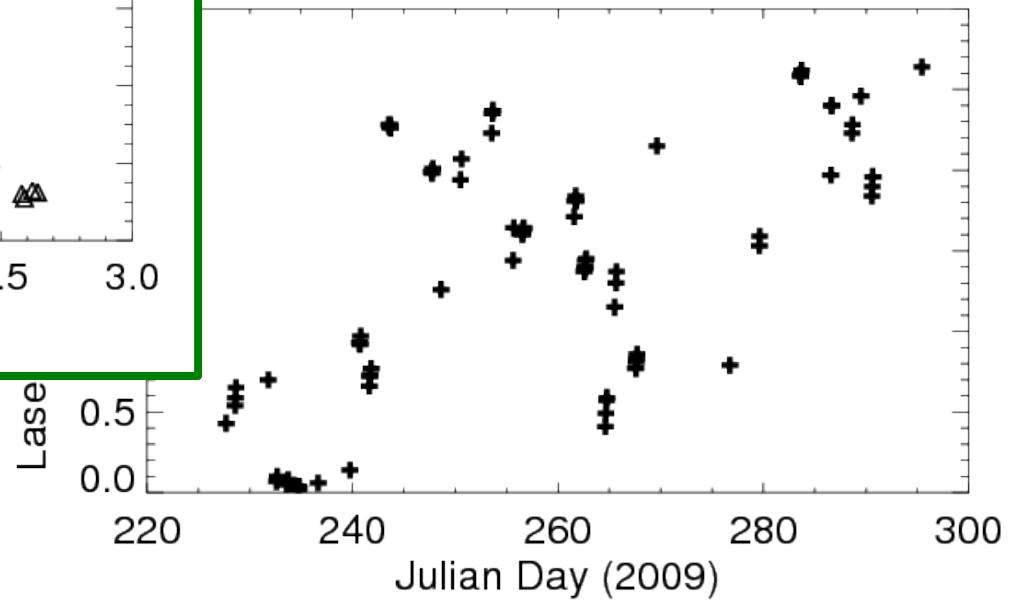
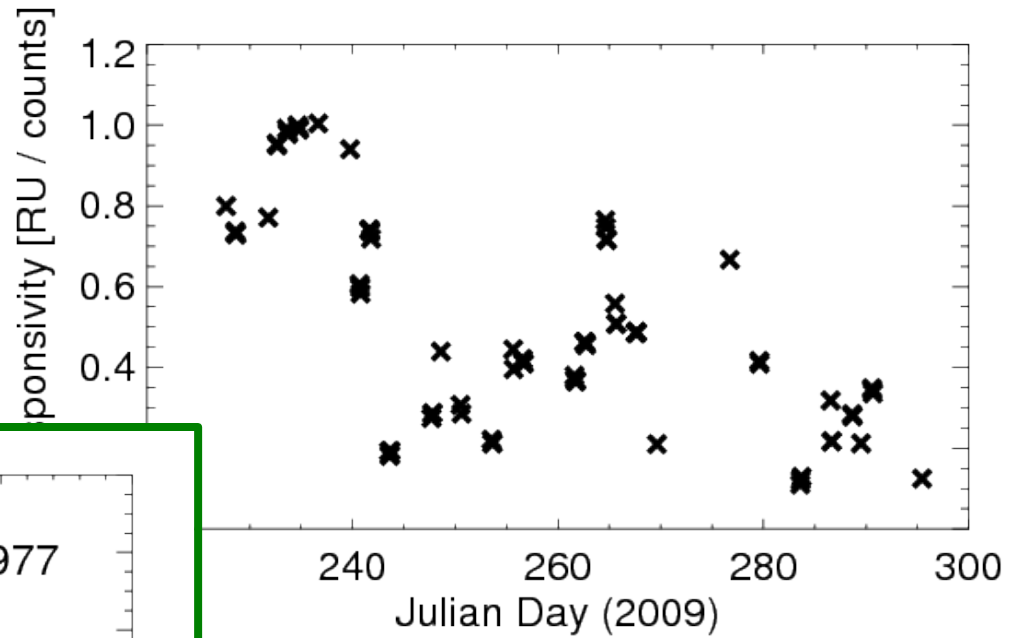
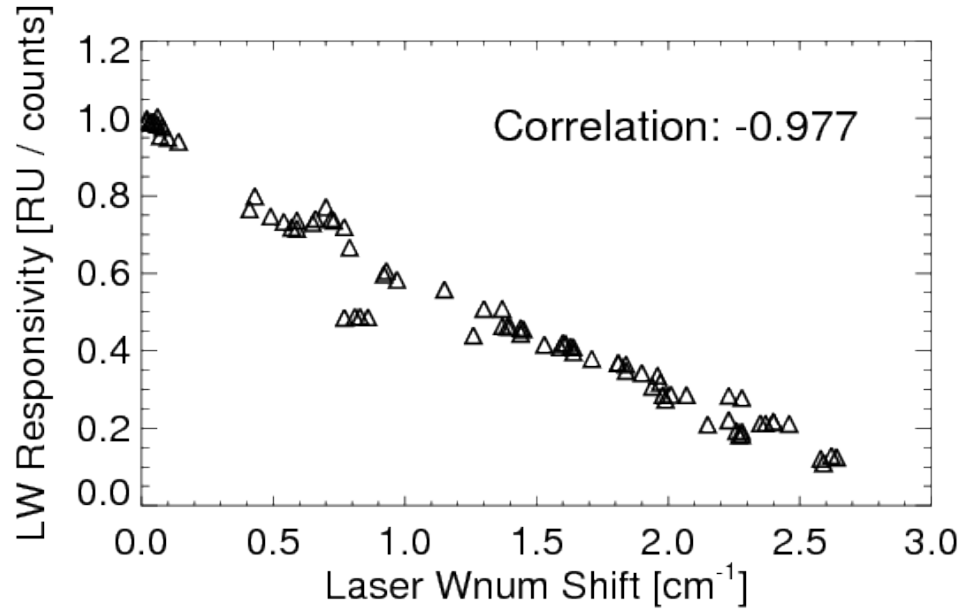
Deck weight



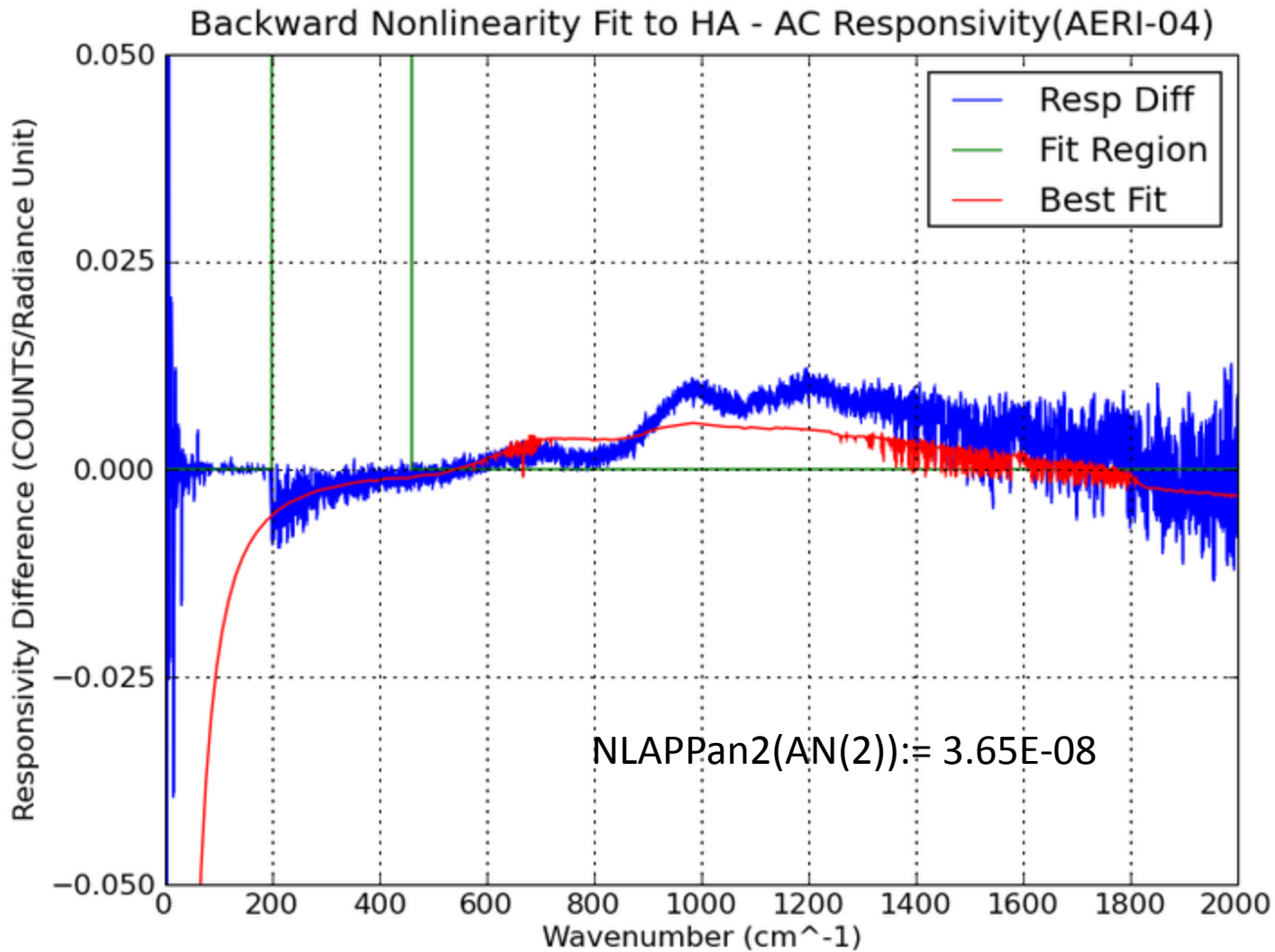
AERI Noise and Responsivity Variations



AERI Responsivity and Spectral Calibration Variations



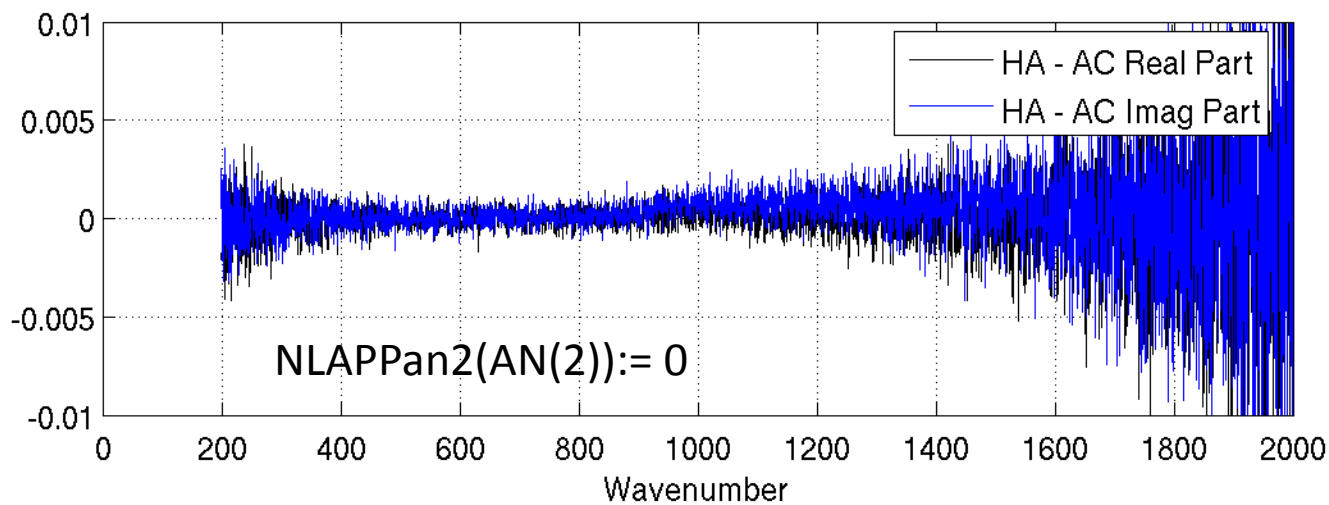
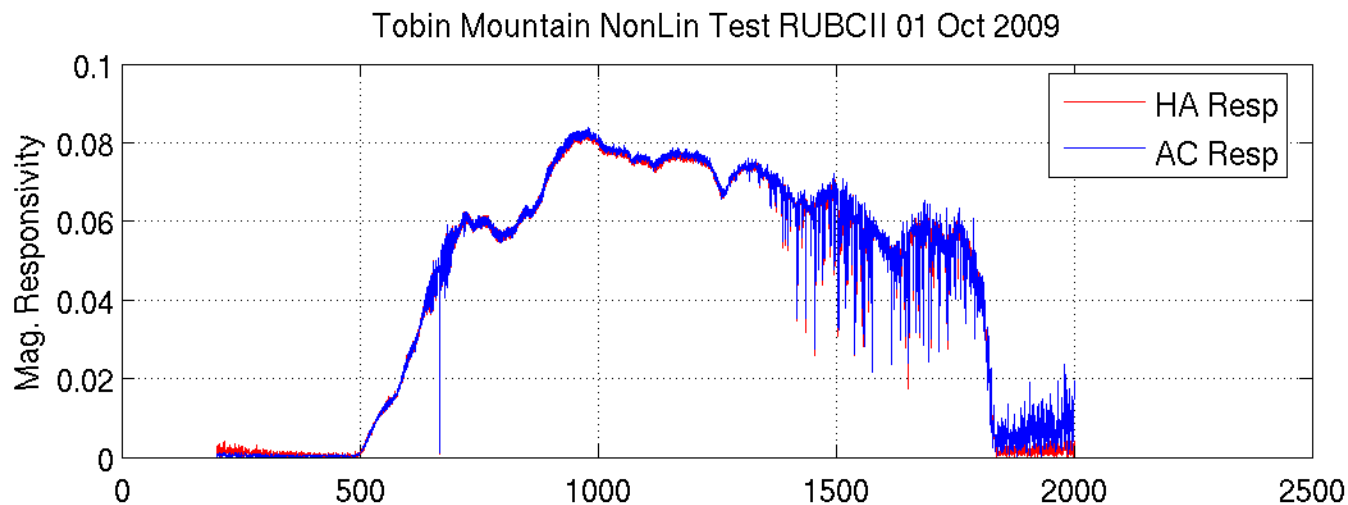
PRE-SHIP NonLinearity Test: 30 June 2009



- This is the pre-ship test conducted on 30 June 2009 which determined a nonlinearity a2 coefficient that was applied to all the field data.

Note
Scale

NonLinearity Test Performed On-site: 1 Oct 2009



Note
Expanded
Scale

- Mean Responsivity Spectra show NO nonlinearity either in-band or out-of-band. This is very surprising and differs from the pre-ship test.

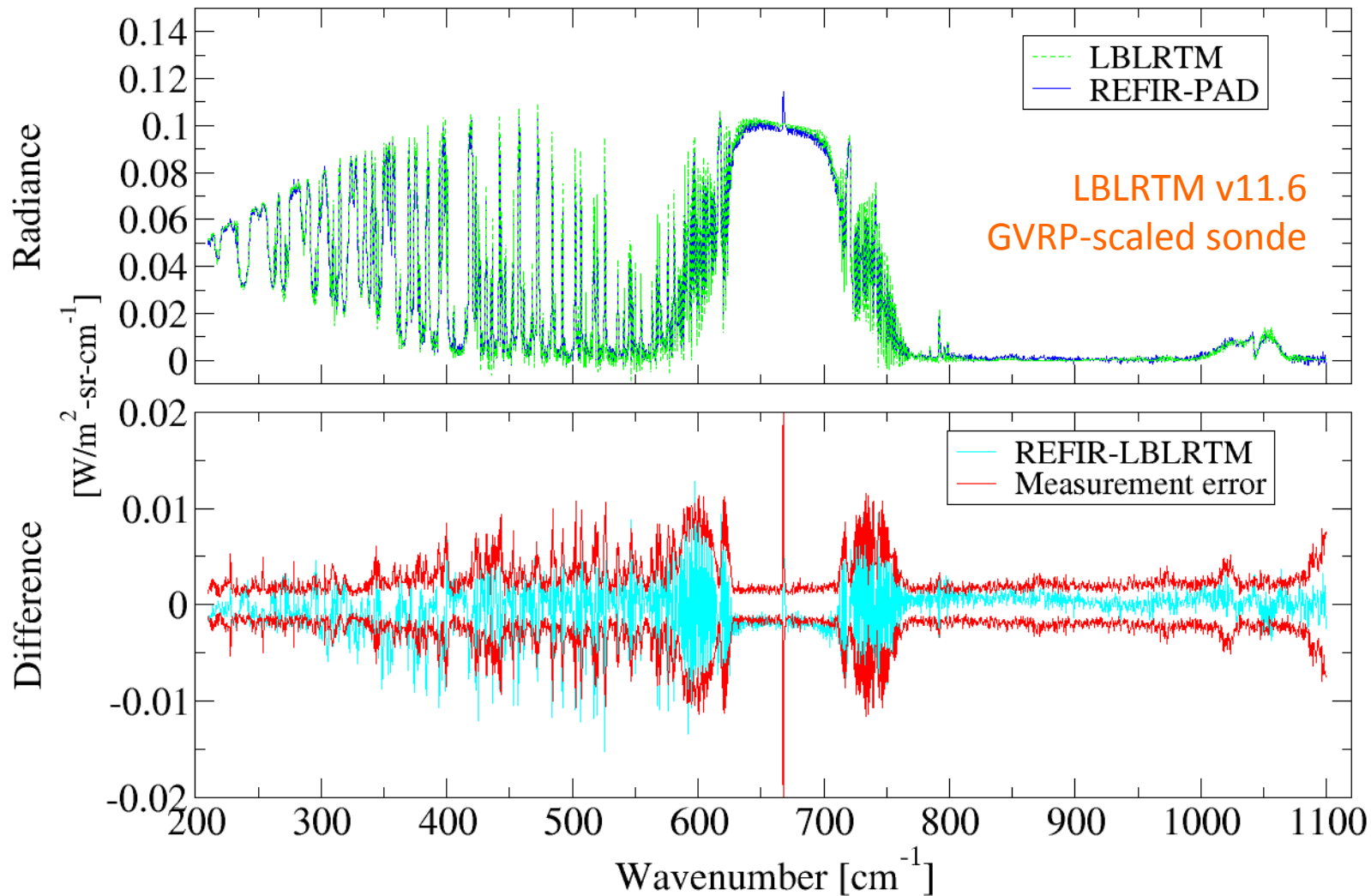
REFIR-PAD



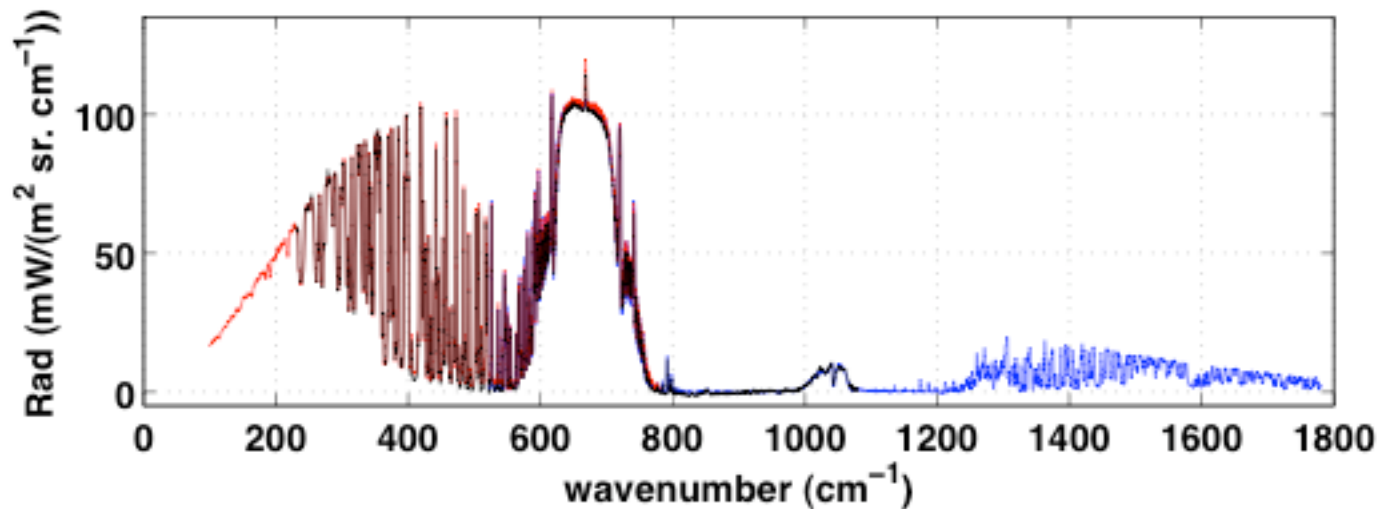
- 210-1100 cm^{-1} at 0.5 cm^{-1} resolution
- 64 s per scan, typical averaging time is 11 min
- Calibration with 2 BBs: 80°C and 13°C

Comparison: REFIR-PAD with LBLRTM

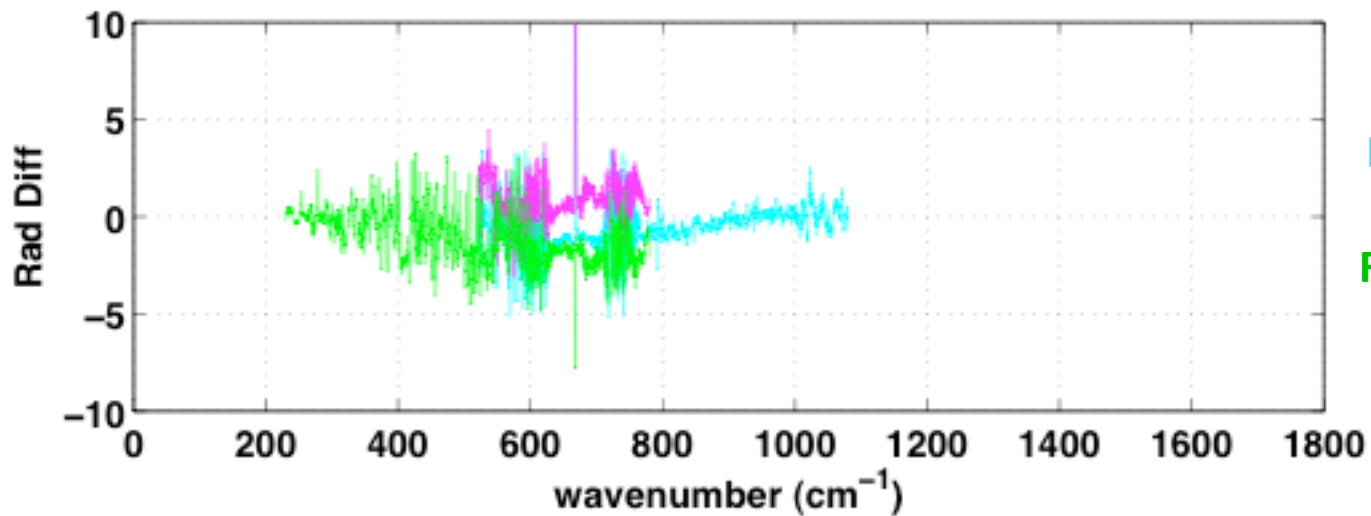
REFIR-PAD IFAC-CNR, Chile 20090919, 1st sonde, 13:03-13:41 UTC



20090825 15:04-19:16 UTC

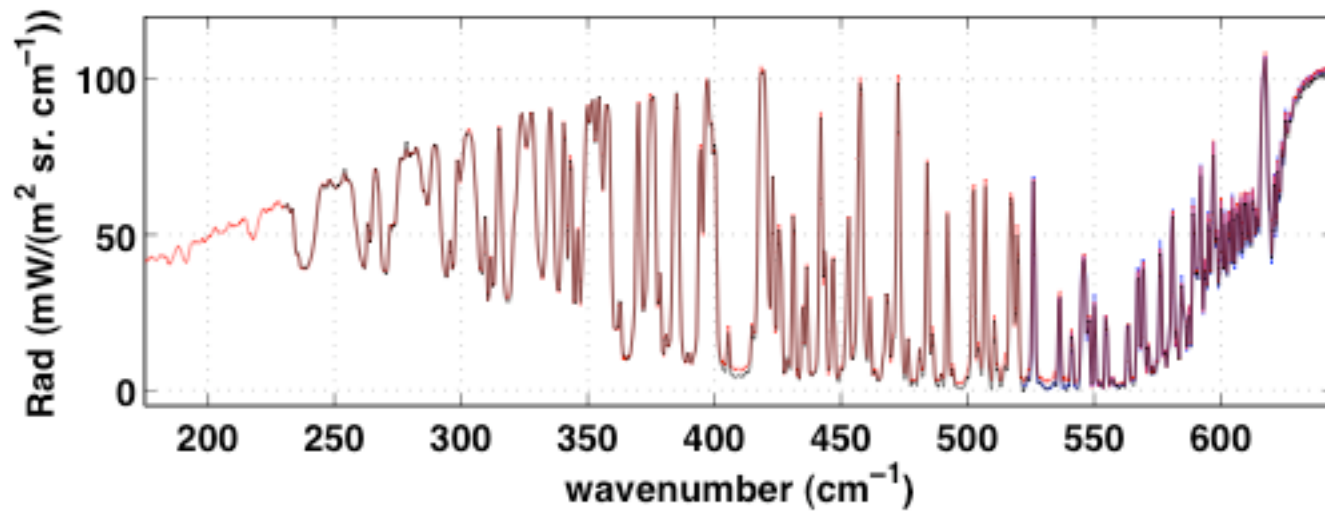


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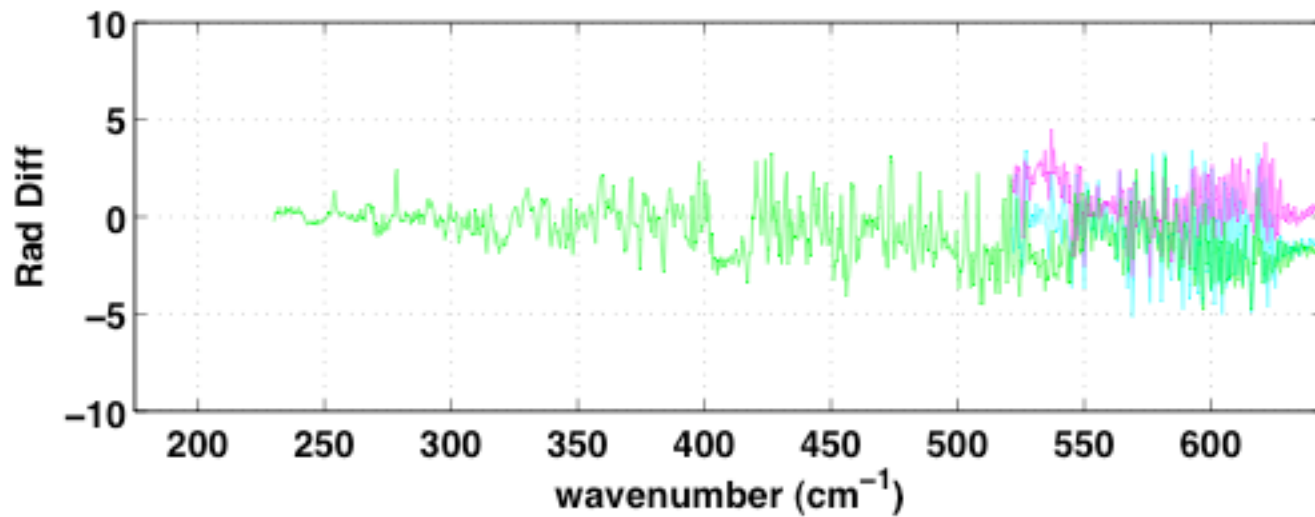


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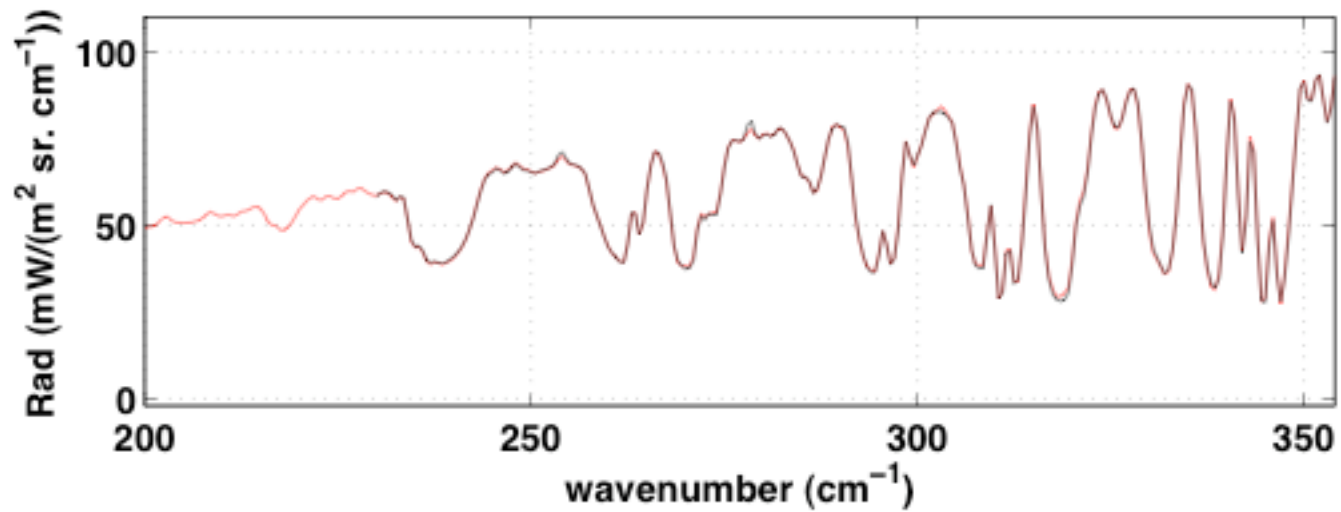


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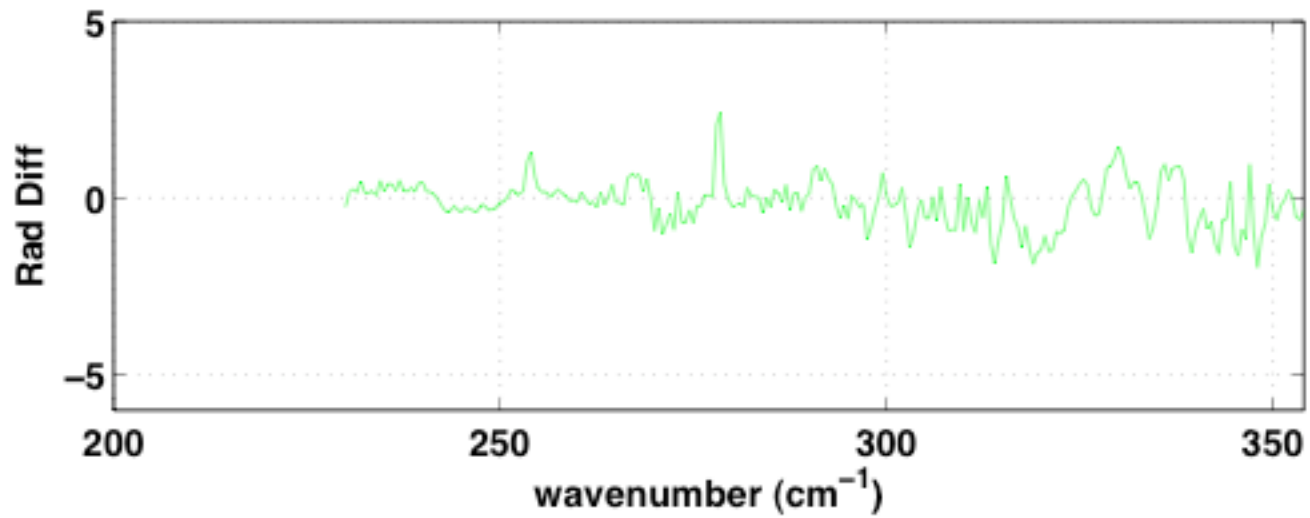


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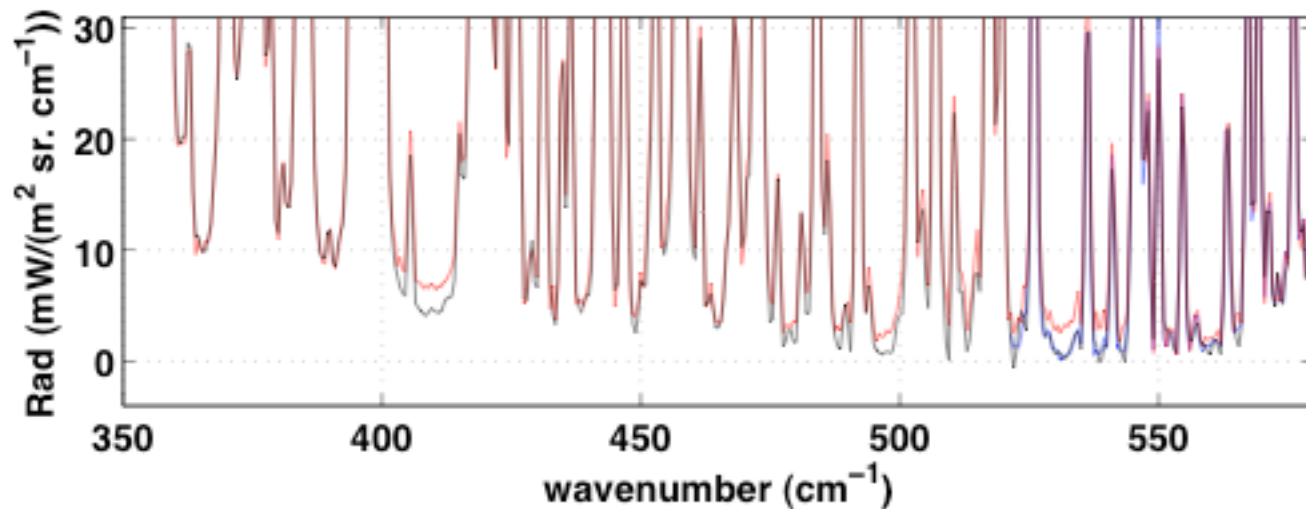


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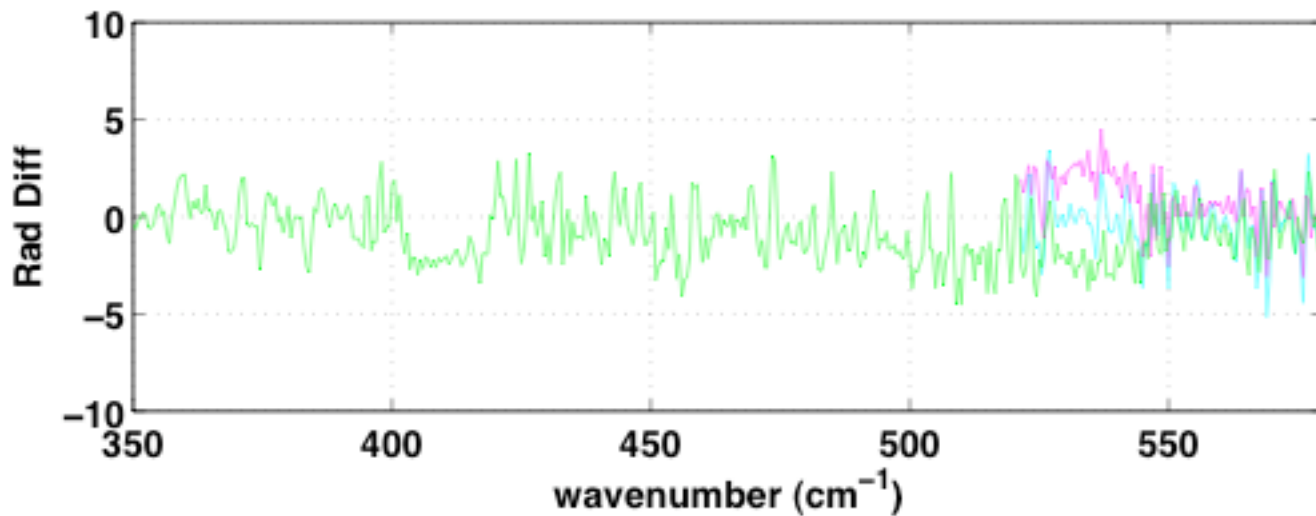


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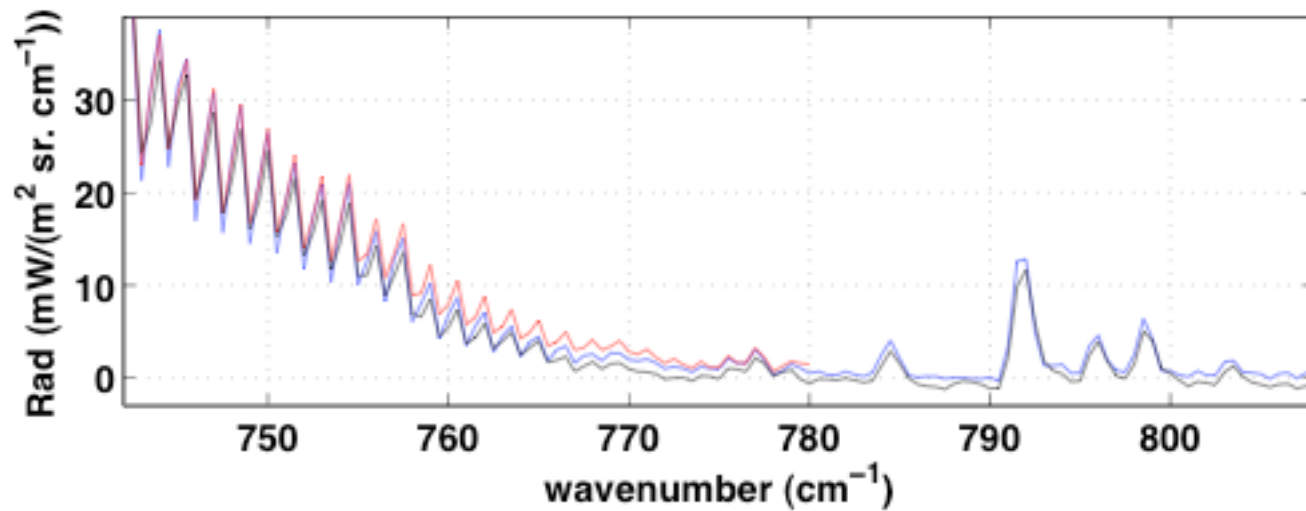


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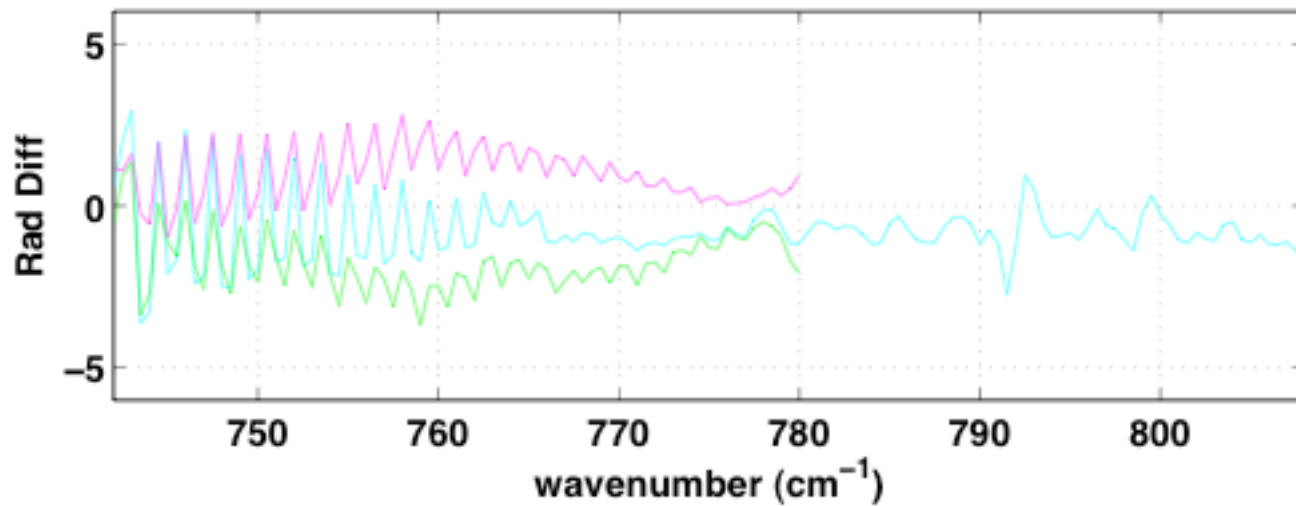


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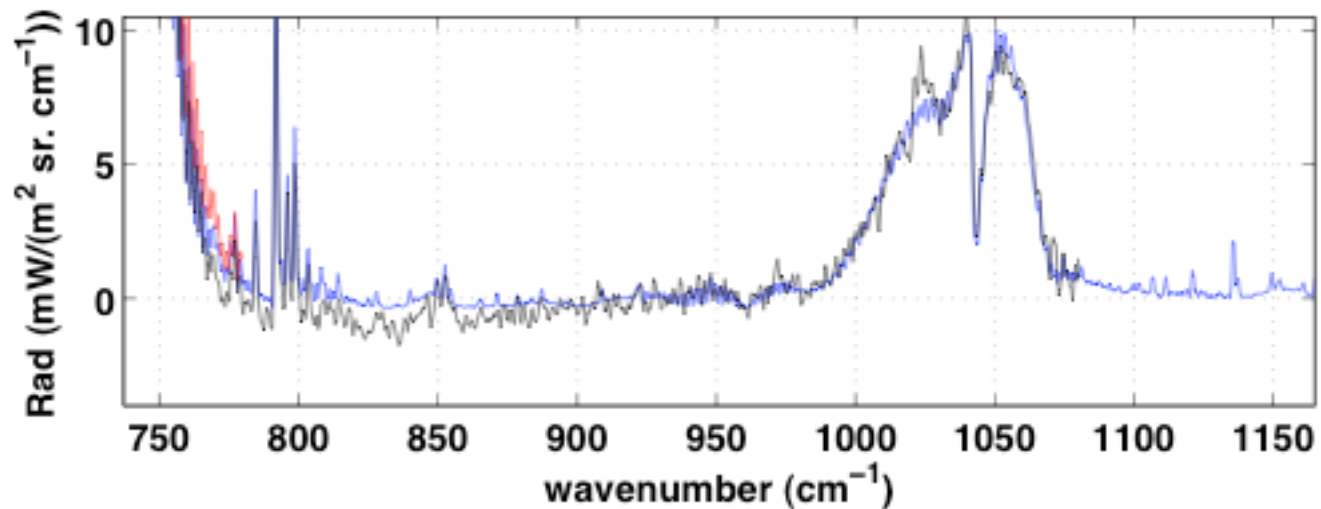


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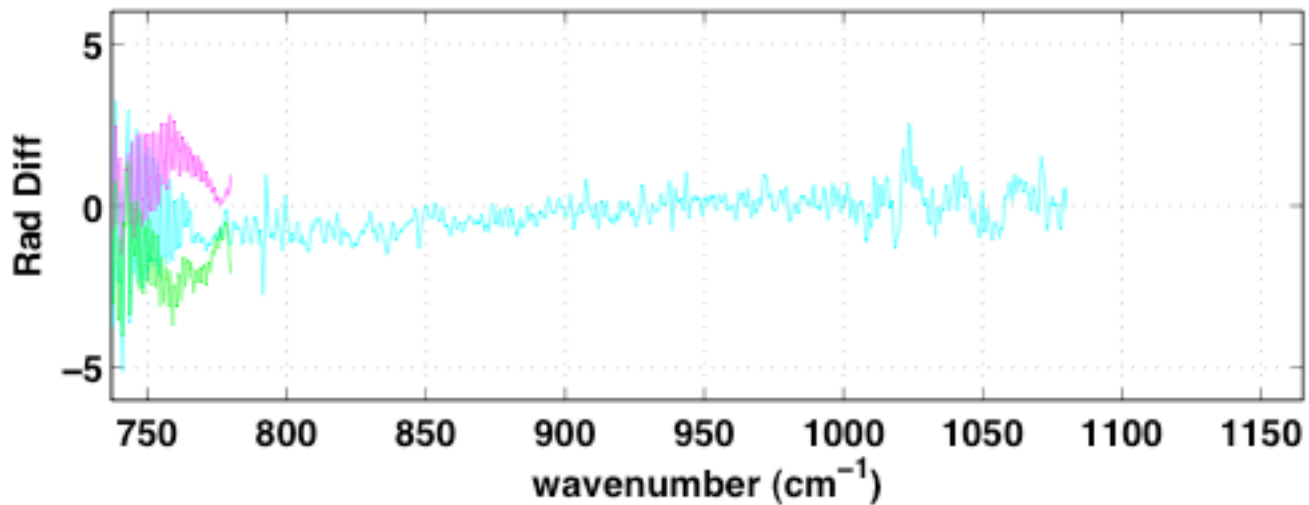


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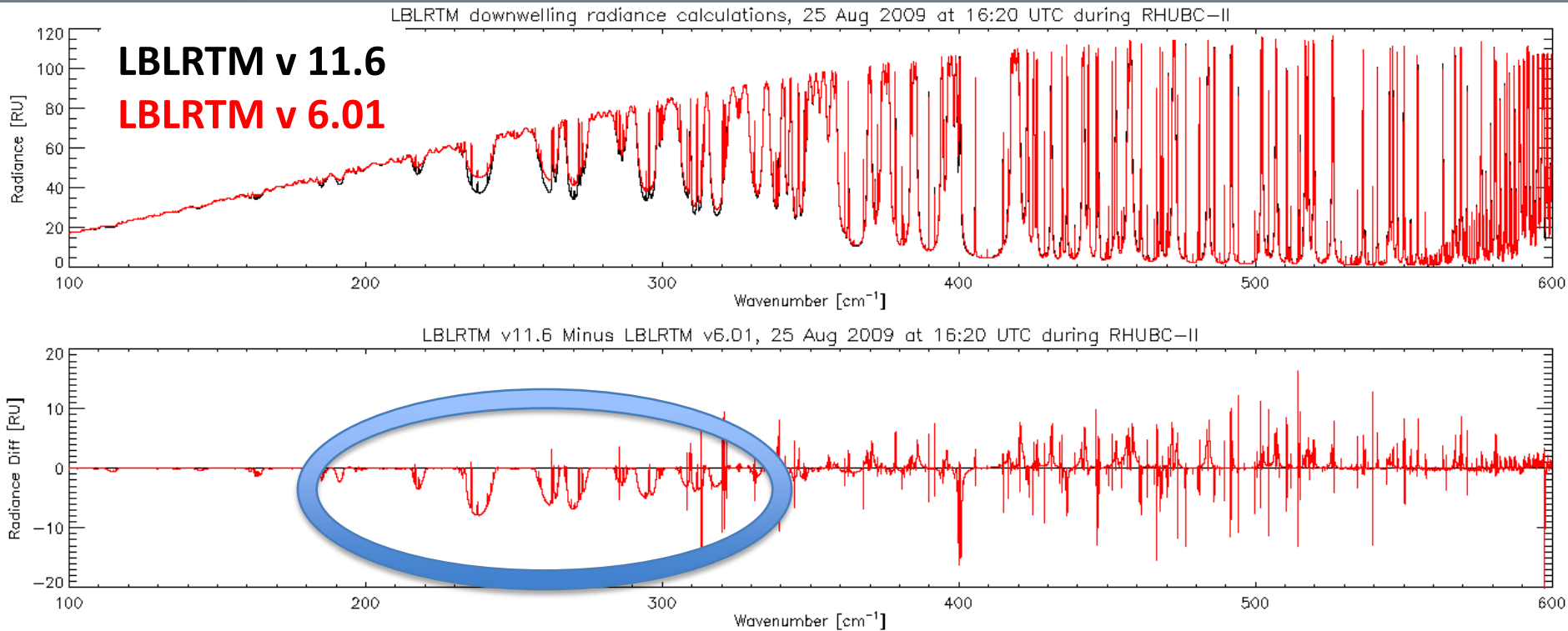


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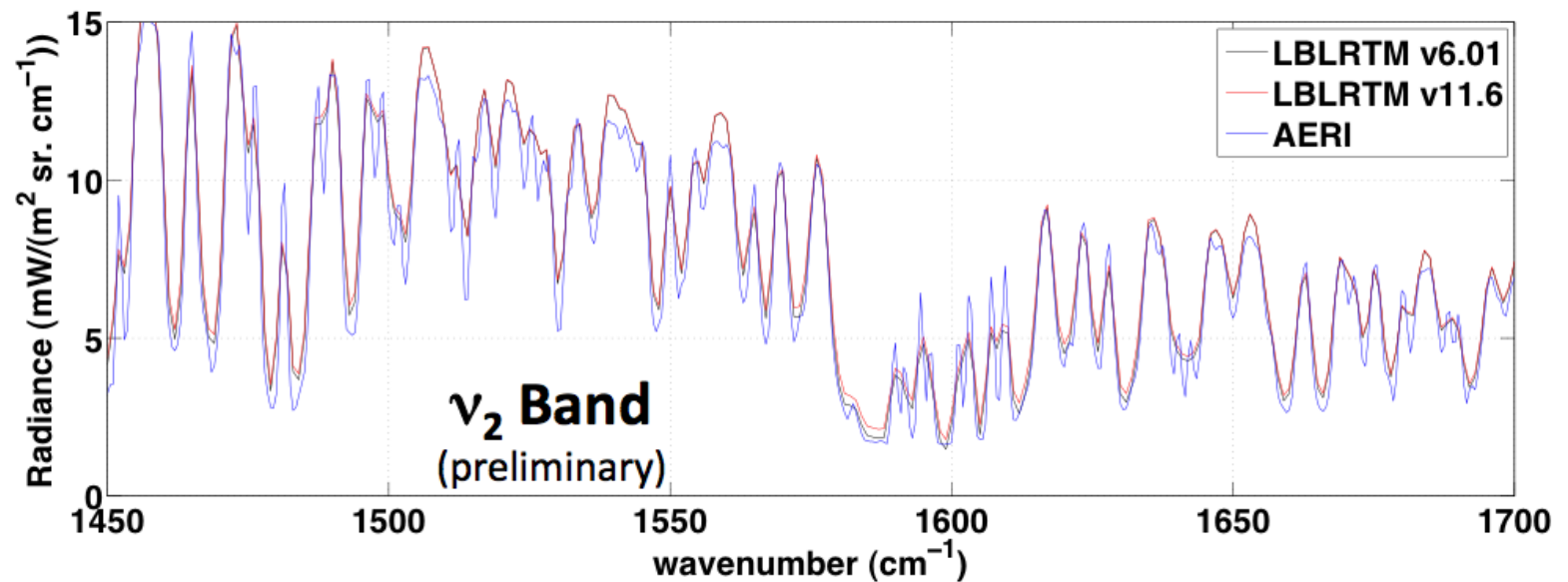
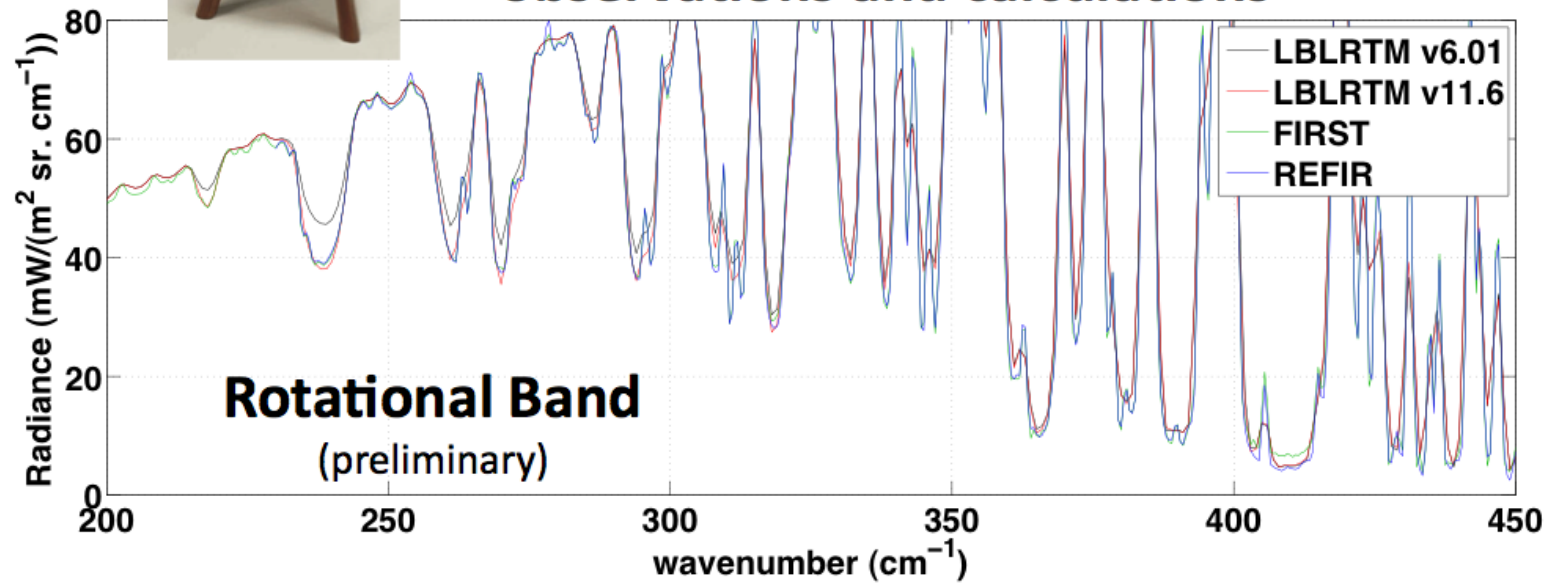
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Difference Between 2 LBLRTM Versions



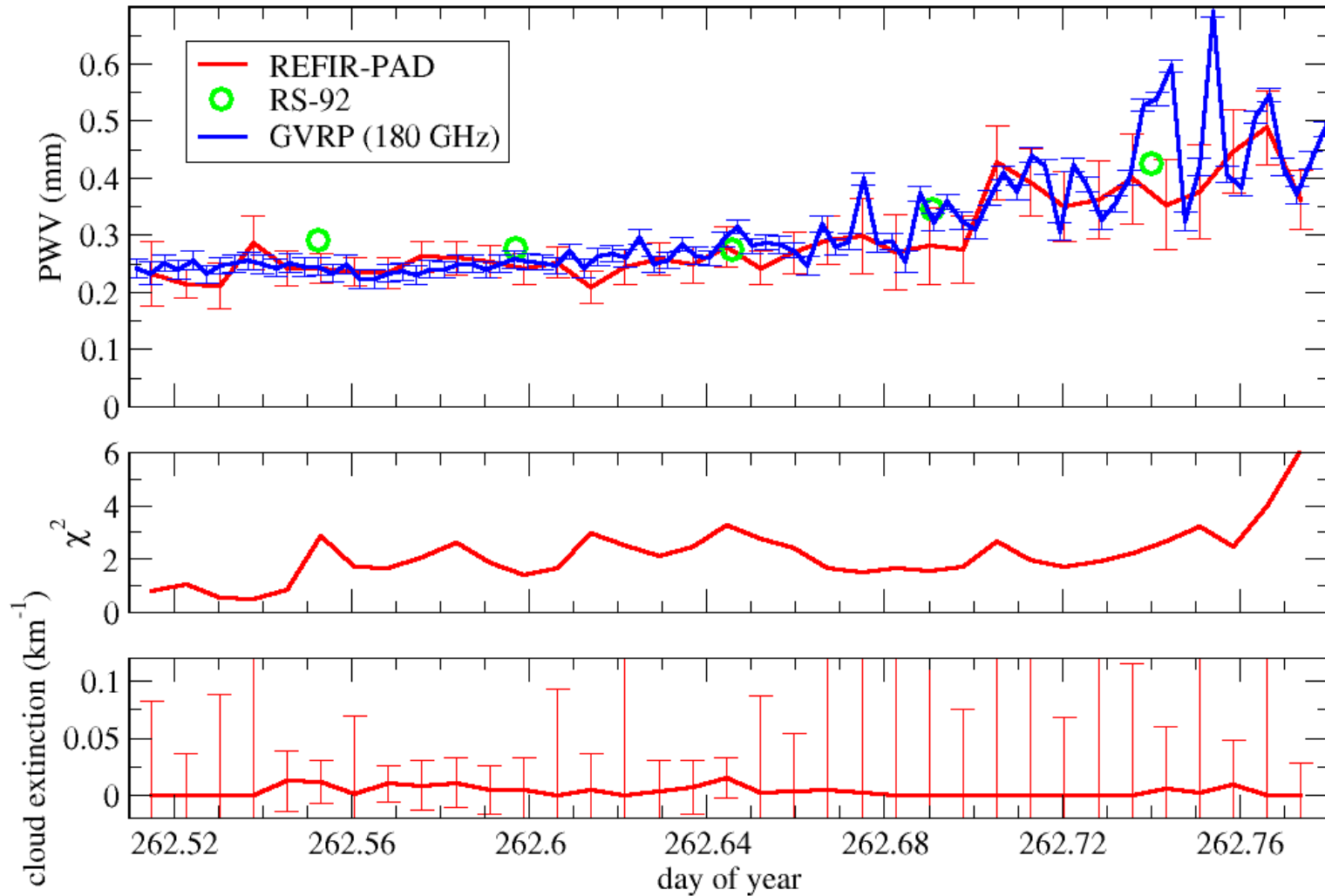


Reconciling differences between observations and calculations



PWV Retrievals from 19 Sep 2009

Cerro Toco, 19/9/2009

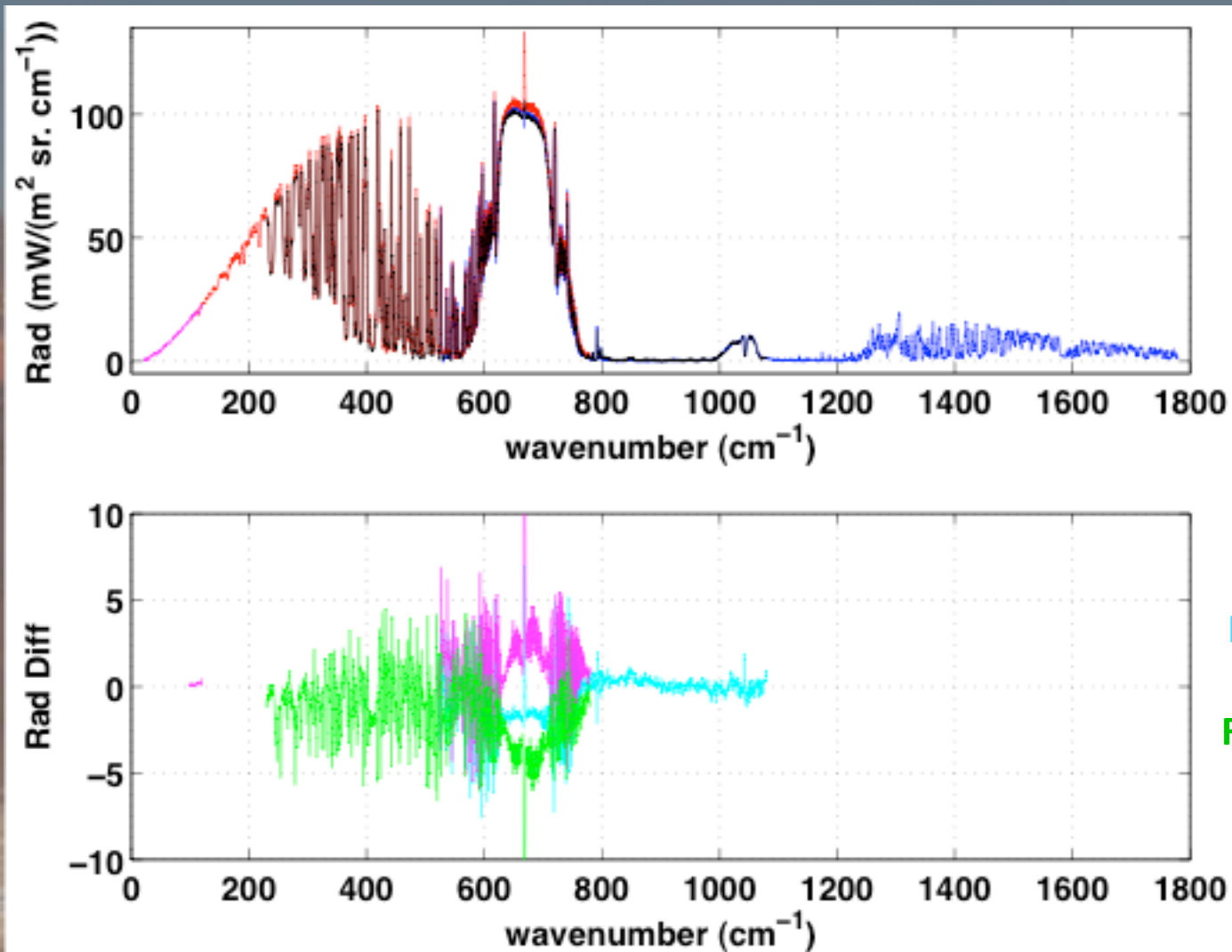


Conclusions

- No conclusions yet
- Issues identified in the AERI data
 - Have been (largely) characterized
 - Recalibration to occur soon
- REFIR-PAD data from channel1 look good
 - Some (wind-induced) artifacts
 - Working on spikes in channel2; if fixed, will improve S/N
- Reasonable agreement between various measurements in different bands
 - Not perfect
 - All measurements are still being scrutinized
- **A lot of promise to greatly reduce the uncertainty in the WV continuum in the far infrared!**



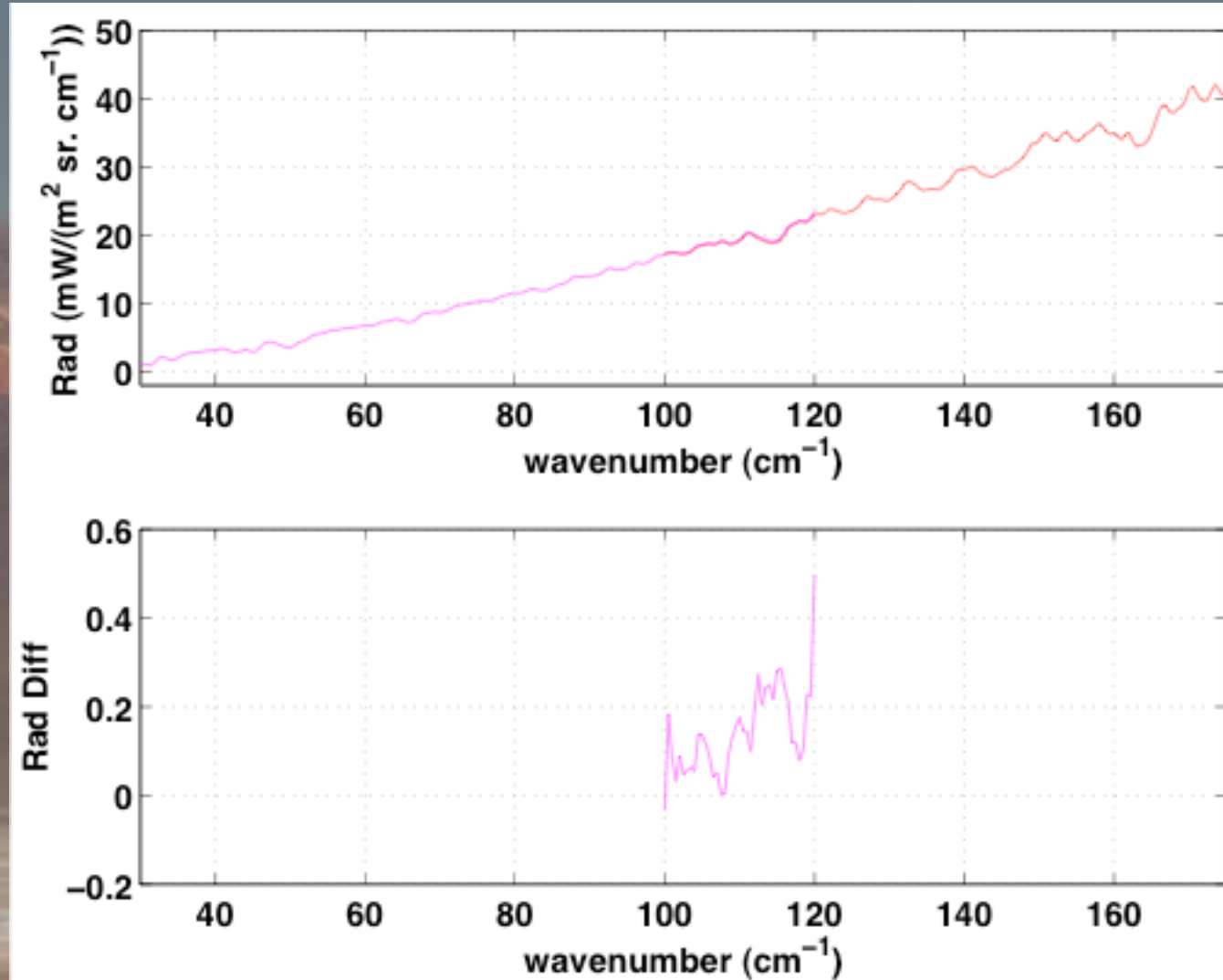
20090919 13:52-16:32 UTC



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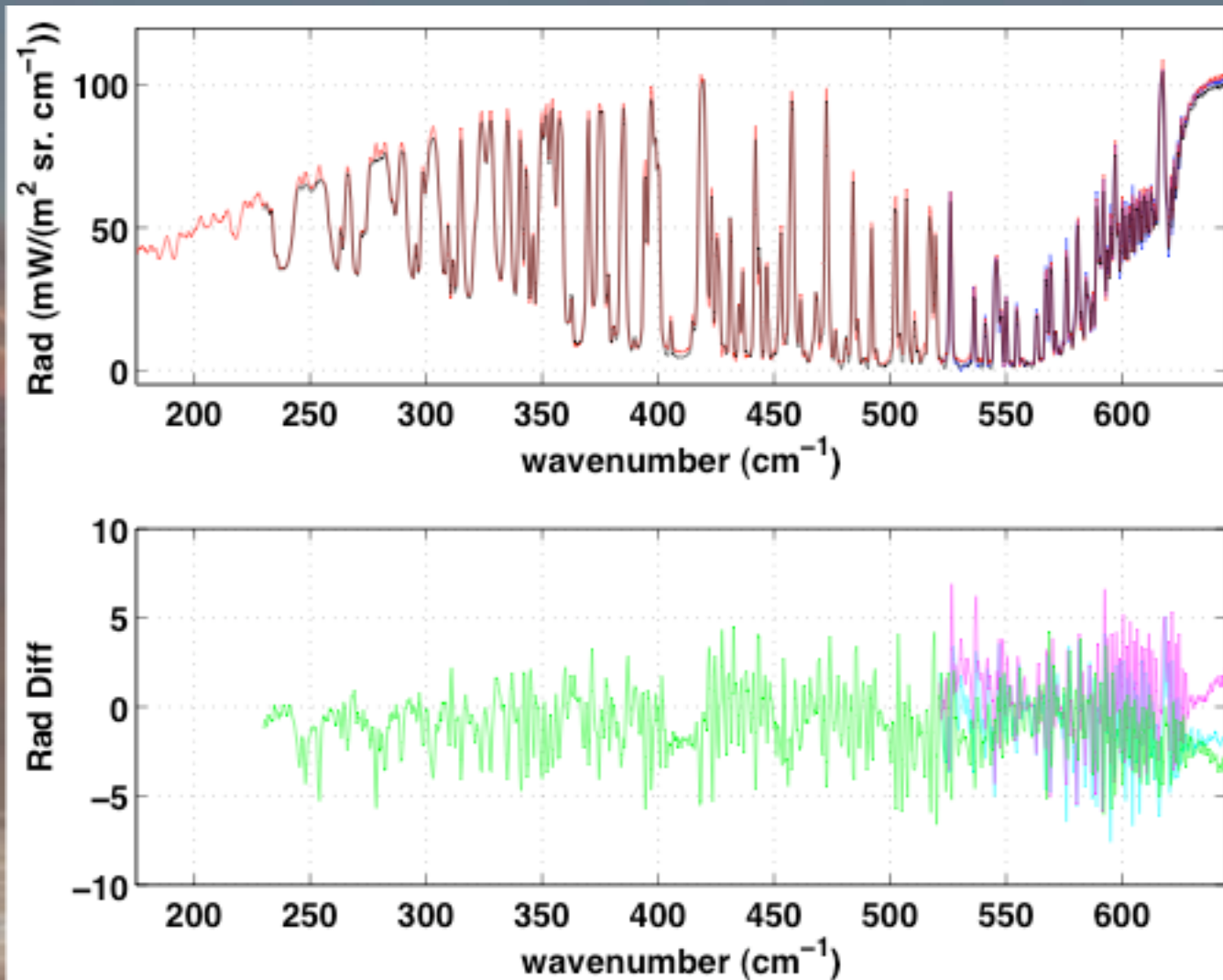
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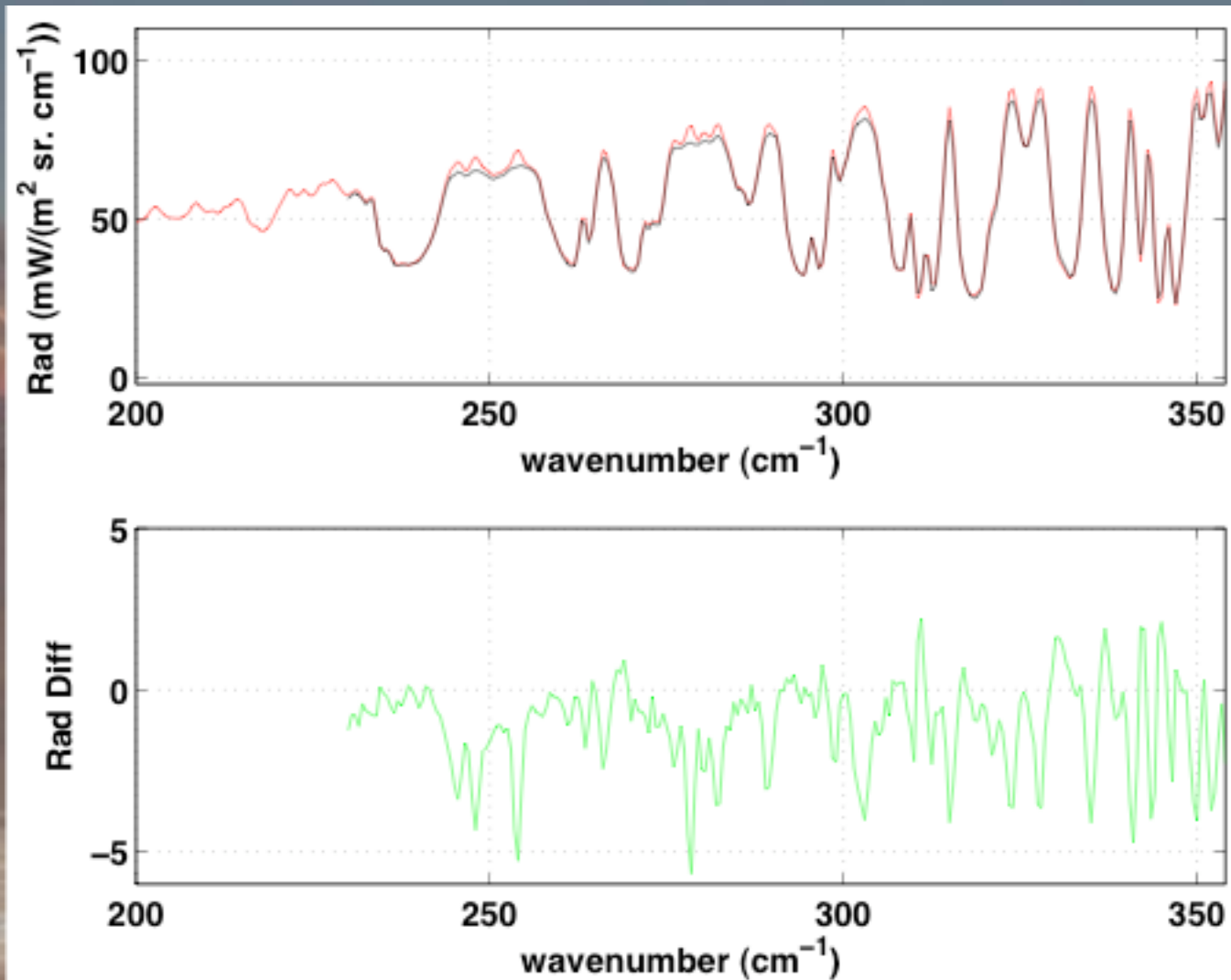
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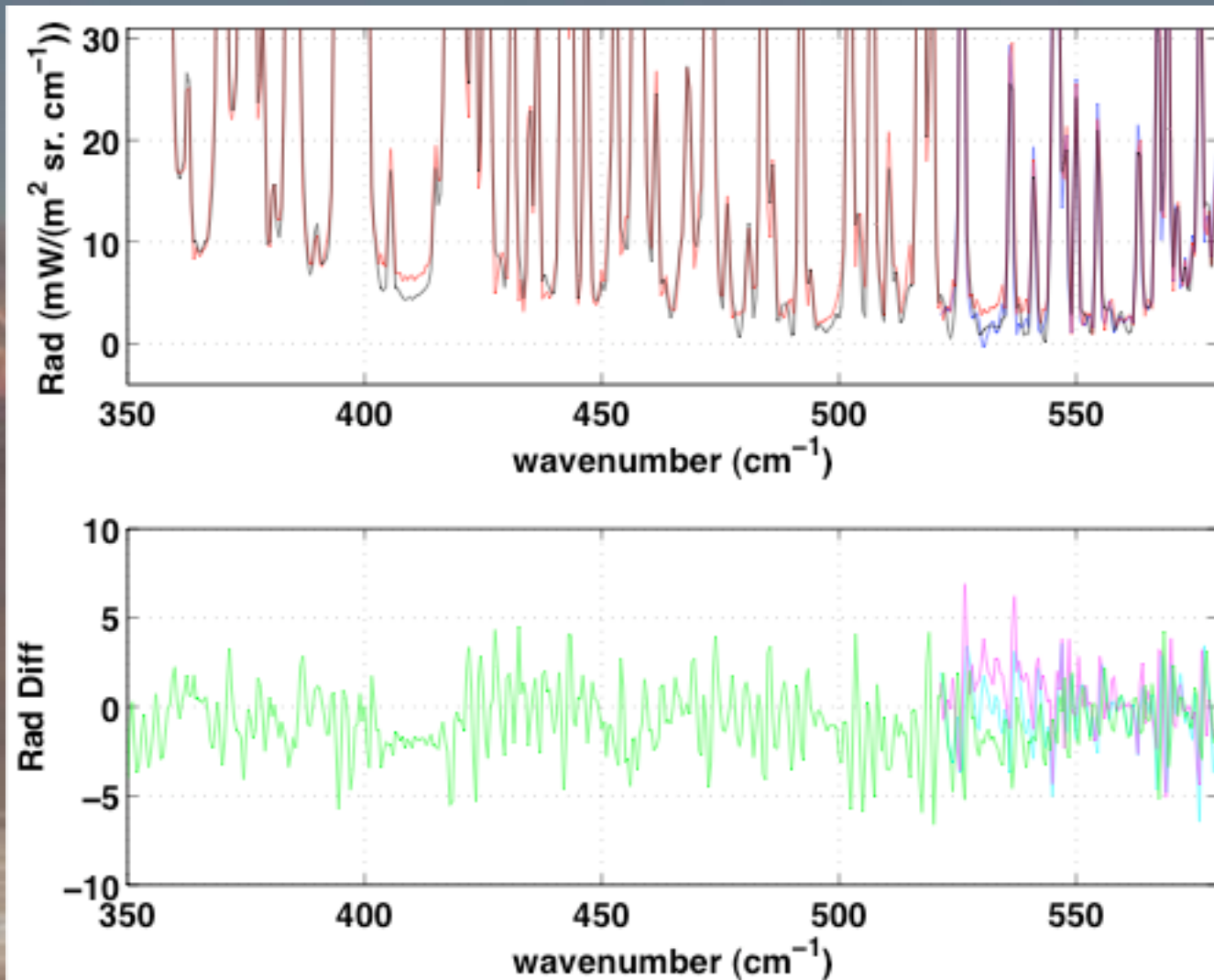
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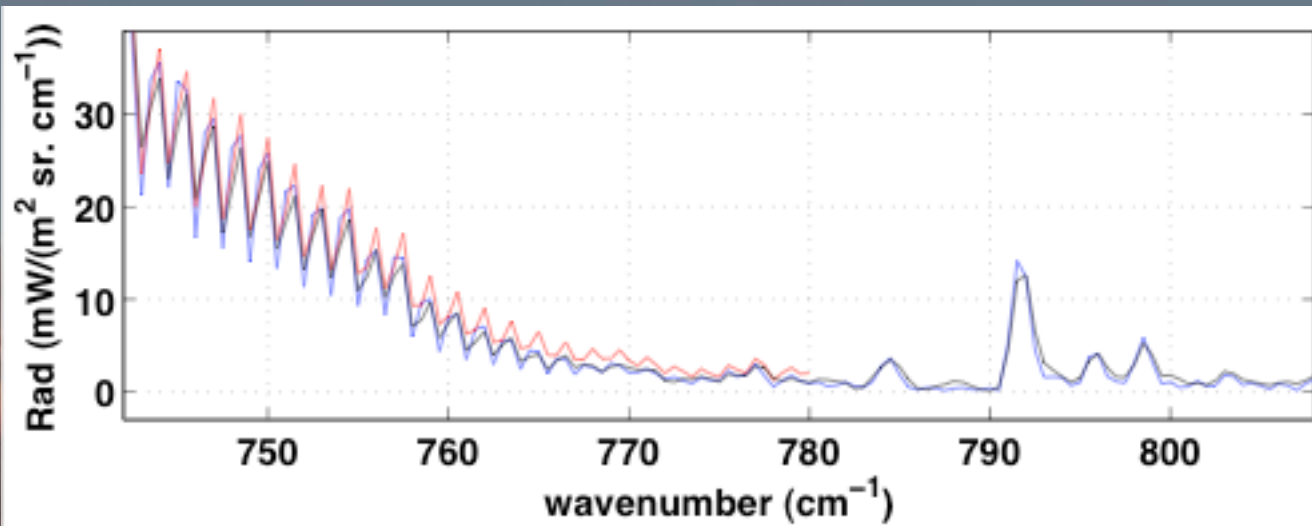
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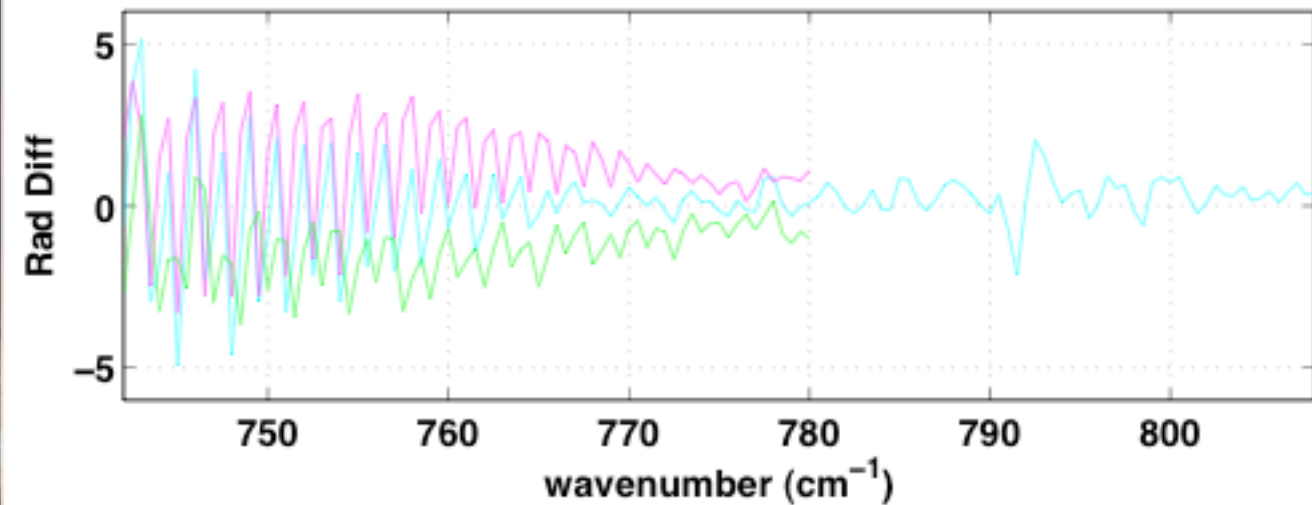
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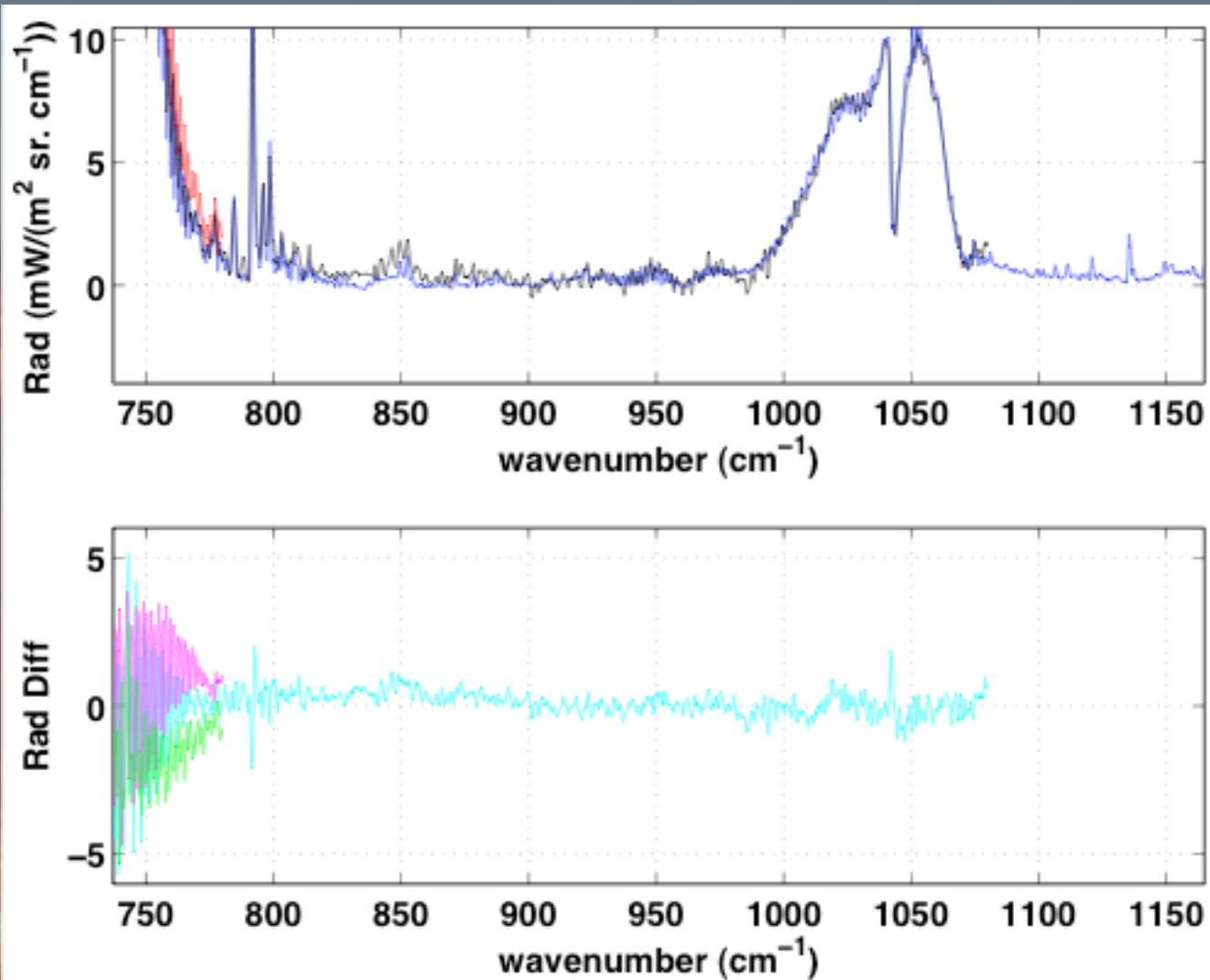


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REFIR-PAD PWV measurements, IFAC-CNR

Cerro Toco, 19/9/2009

