The AERI/LBLRTM QME:

A Radiative Transfer Closure Experiment

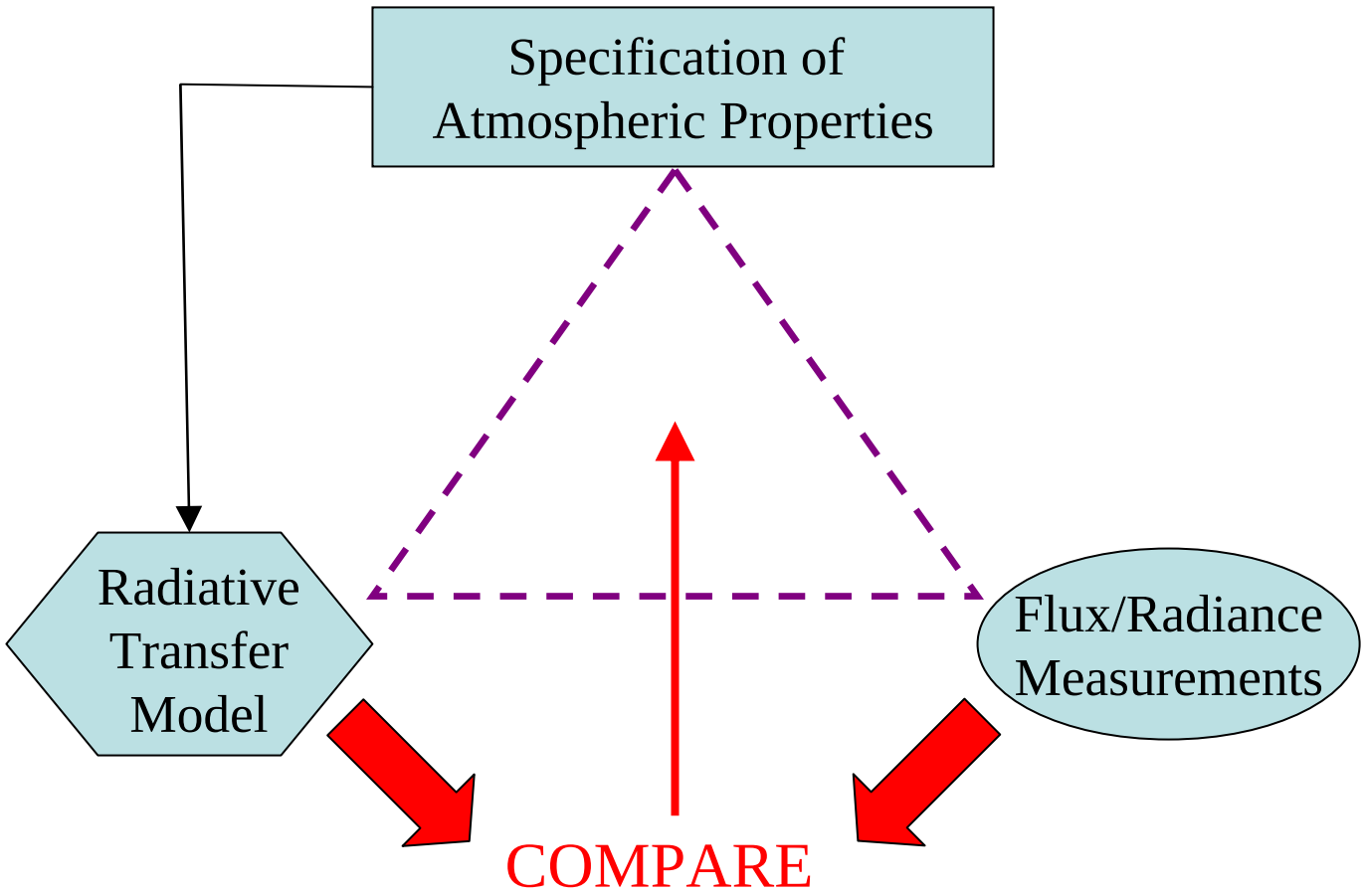
S. Clough, J. Delamere, E. Mlawer,, M. Shephard (AER, Inc.)

R. Knuteson, H. Revercomb, D. Tobin, D. Turner (University of Wisconsin)

T. Shippert, C. Long (PNNL)

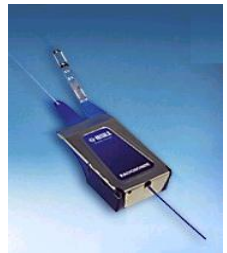
R. Ellingson (Florida State University)

Radiative Closure Concept

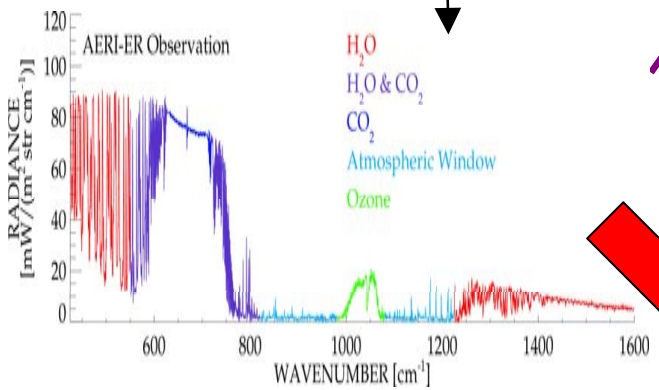


AERI/LBLRTM QME

MWR



Radiosonde



LBLRTM

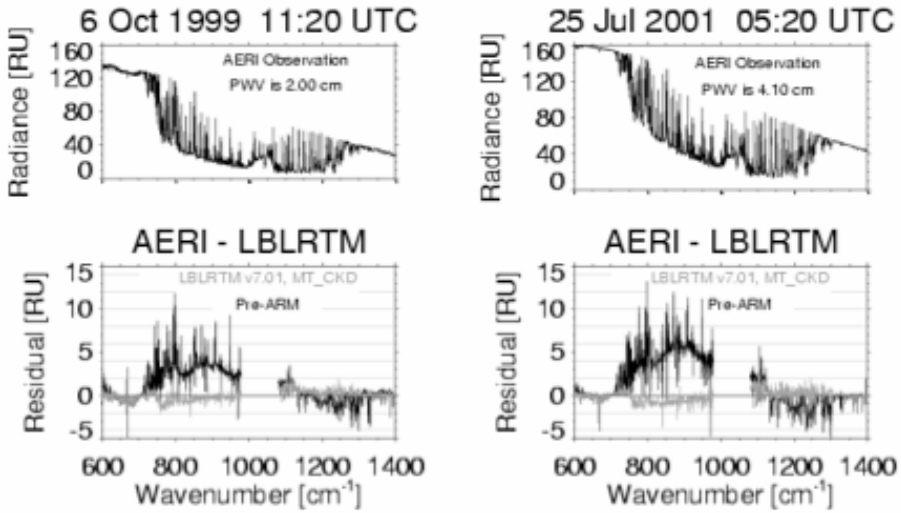
(HITRAN, Continuum)

COMPARE

AERI

SGP QME Key Findings

- Improved modeling of longwave downwelling radiation

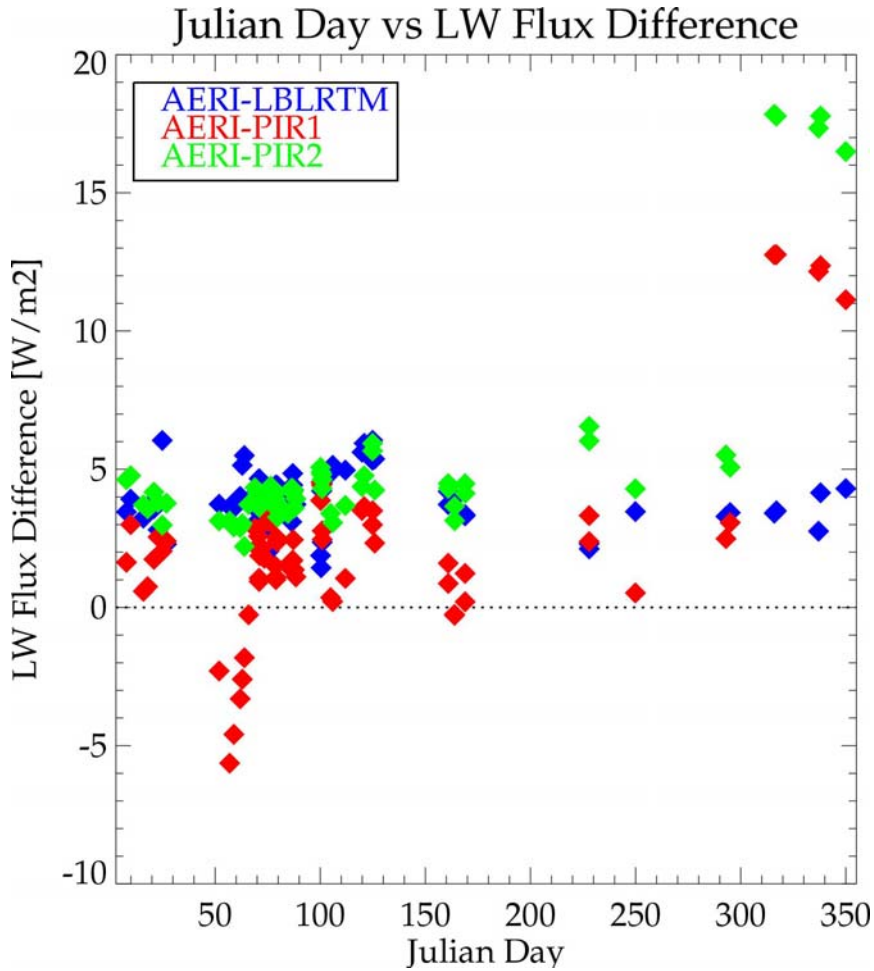


SGP QME Key Findings

- Improved modeling of longwave downwelling radiation
- MWR-scaling of input water vapor profile improved radiance calculations over nominal radiosondes
- Success of AERI/LBLRTM QME led to implementation of the LW Flux QME
  - Addition of RRTM and pyrgeometers
- Publication in J. Atmos. Science (Turner et al. 2004)

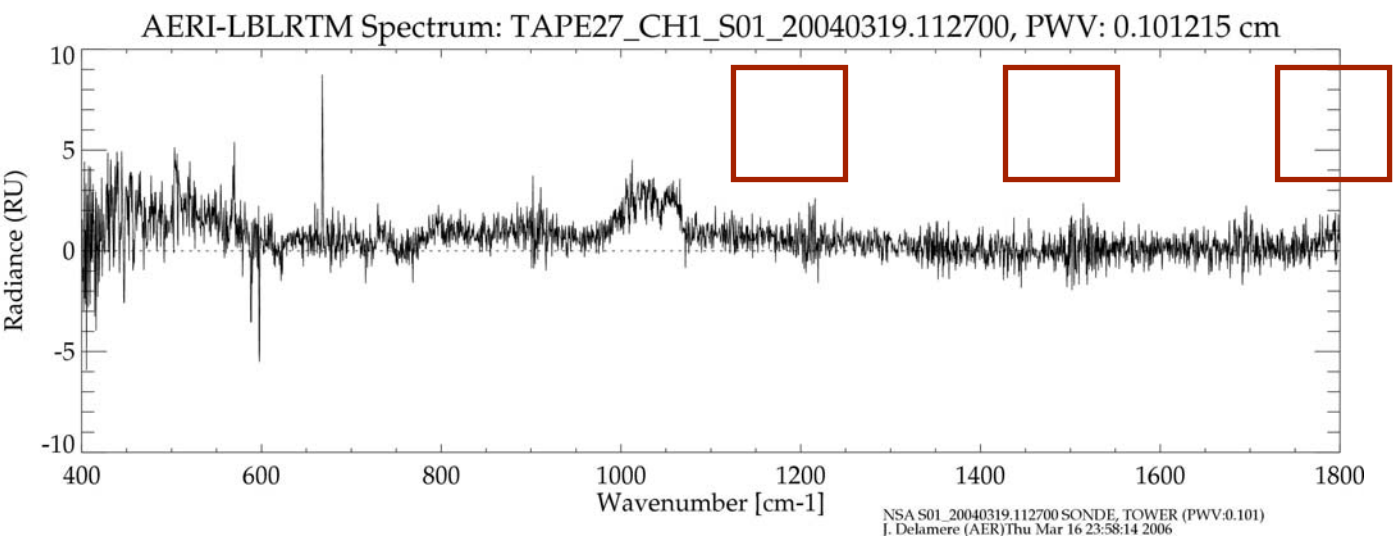
Uncovering Instrument Issues

- PIR calibration at all sites



Uncovering Instrument Issues

- PIR calibration at all sites
- Excessive noise in the NSA AERI from 2004 onward



Uncovering Instrument Issues

- PIR calibration procedures at all sites
- Excessive noise in the NSA AERI from 2004 onward
- The 2002 revision to the MWR retrieval coefficients

Future of AERI/LBLRTM QME

- Reprocessing QME at SGP
  - Mid-1994 to Jan. 2005
  - Older versions of LBLRTM/HITRAN/MT_CKD
- Move QME to all sites?
- Can we repackage the QME output to facilitate quicker detection of instrument issues, etc?
- What overlap exists with other VAPS?