

**An assessment of the accuracy of the  
RTTOV fast radiative transfer model  
using IASI data**

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Tony McNally**

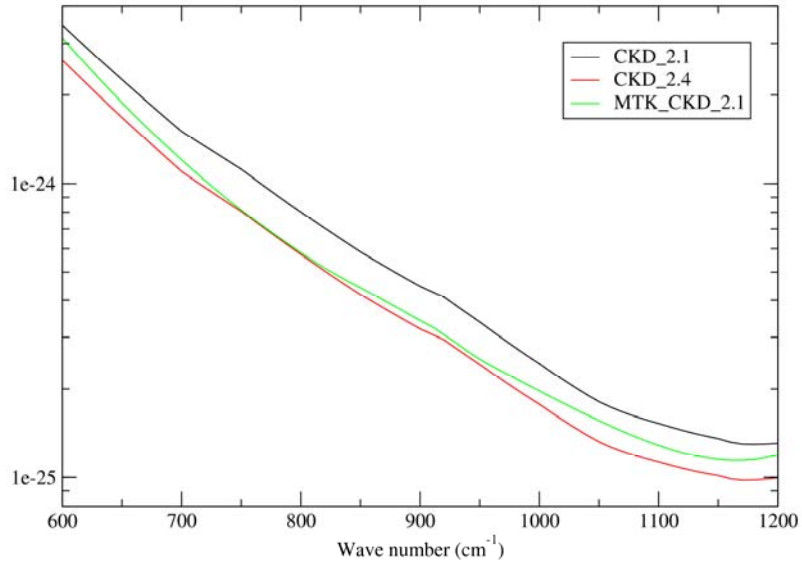
ECMWF, Shinfield Park, Reading, UK

Four monitoring experiments have been run using cycle 33R1 of the ECMWF Integrated Forecasting System (IFS).

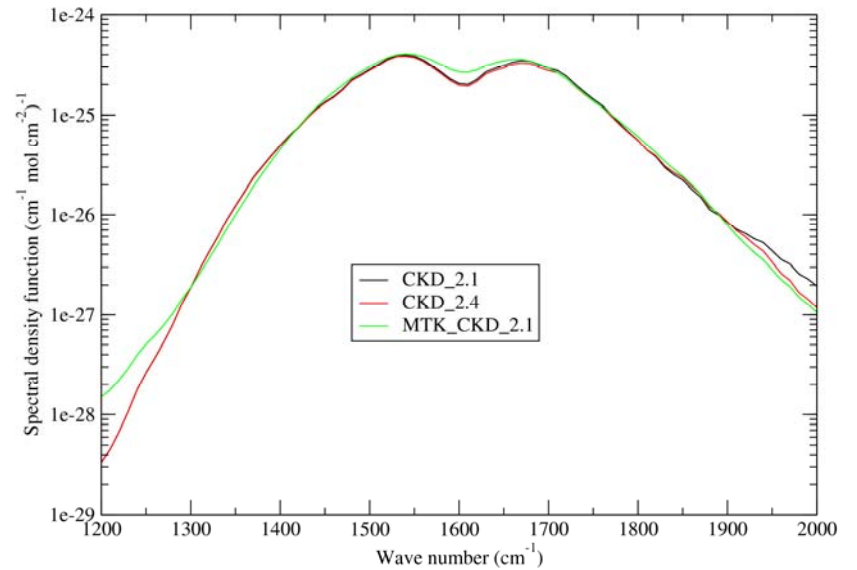
IASI radiances have been compared to radiances simulated using version 8 and version 9 of the RTTOV fast forward model utilizing analysed fields of temperature, water vapour and ozone at 00Z and 12Z on the 1<sup>st</sup> April 2008.

<p>RTTOV-8 kCARTA 43 levels 52 profile training set</p>	<p>MT_CKD_v1.1  <i>Mlawer et al. (2004)</i></p>	<p>CO<sub>2</sub> P/Q/R branch Line mixing (v2 and v3) <i>Strow et al. (2002)</i></p>	<p>HITRAN_2000 <i>Rothman et al. (2003)</i></p>
<p>RTTOV-8 GENLN2 43 levels 43 profile training set</p>	<p>CKD_2.1  <i>Clough et al. (1989)</i></p>	<p>CO<sub>2</sub> Q branch (v2 and v3)  <i>Strow et al. (1994)</i></p>	<p>HITRAN_1996 <i>Rothman et al. (1998)</i></p>
<p>RTTOV-9 GENLN2 100 levels 43 profile training set</p>	<p>CKD_2.4  <i>Clough et al. (1989)</i></p>	<p>CO<sub>2</sub> Q branch (v2 and v3)  <i>Strow et al. (1994)</i></p>	<p>HITRAN_2000 <i>Rothman et al. (2003)</i></p>
<p>RTTOV-9 LBLRTM 100 levels 83 profile training set</p>	<p>MT_CKD_v1.1  <i>Mlawer et al. (2004)</i></p>	<p>CO<sub>2</sub> P/Q/R branch Line mixing (v2 and v3) <i>Niro et al. (2005)</i></p>	<p>HITRAN_2000 HITRAN_2004/06 <i>Rothman et al. (2003)</i> GEISA_2003 <i>Husson et al. (2005)</i></p>

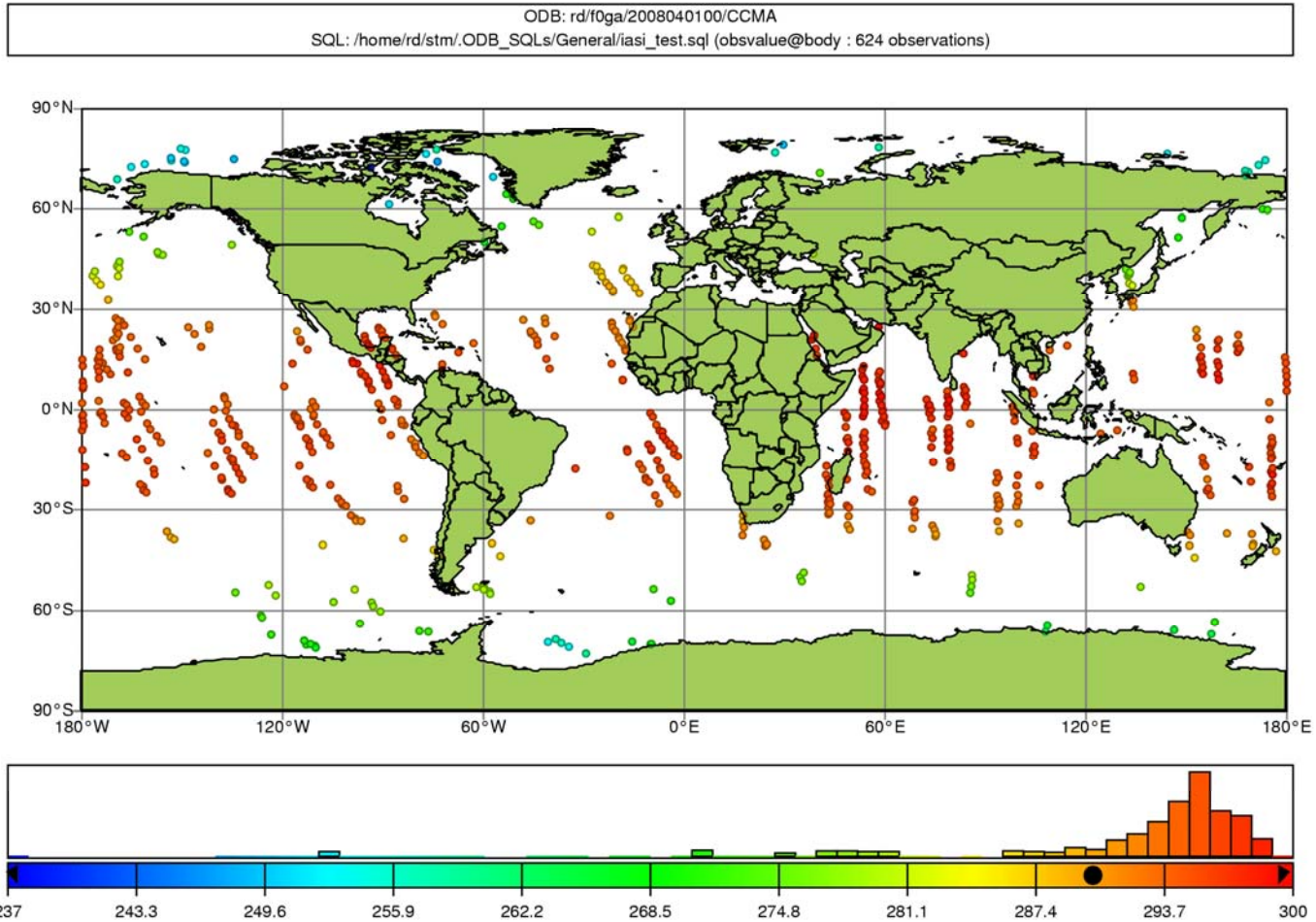
### Self broadening coefficients at 296 K and 1013 hPa



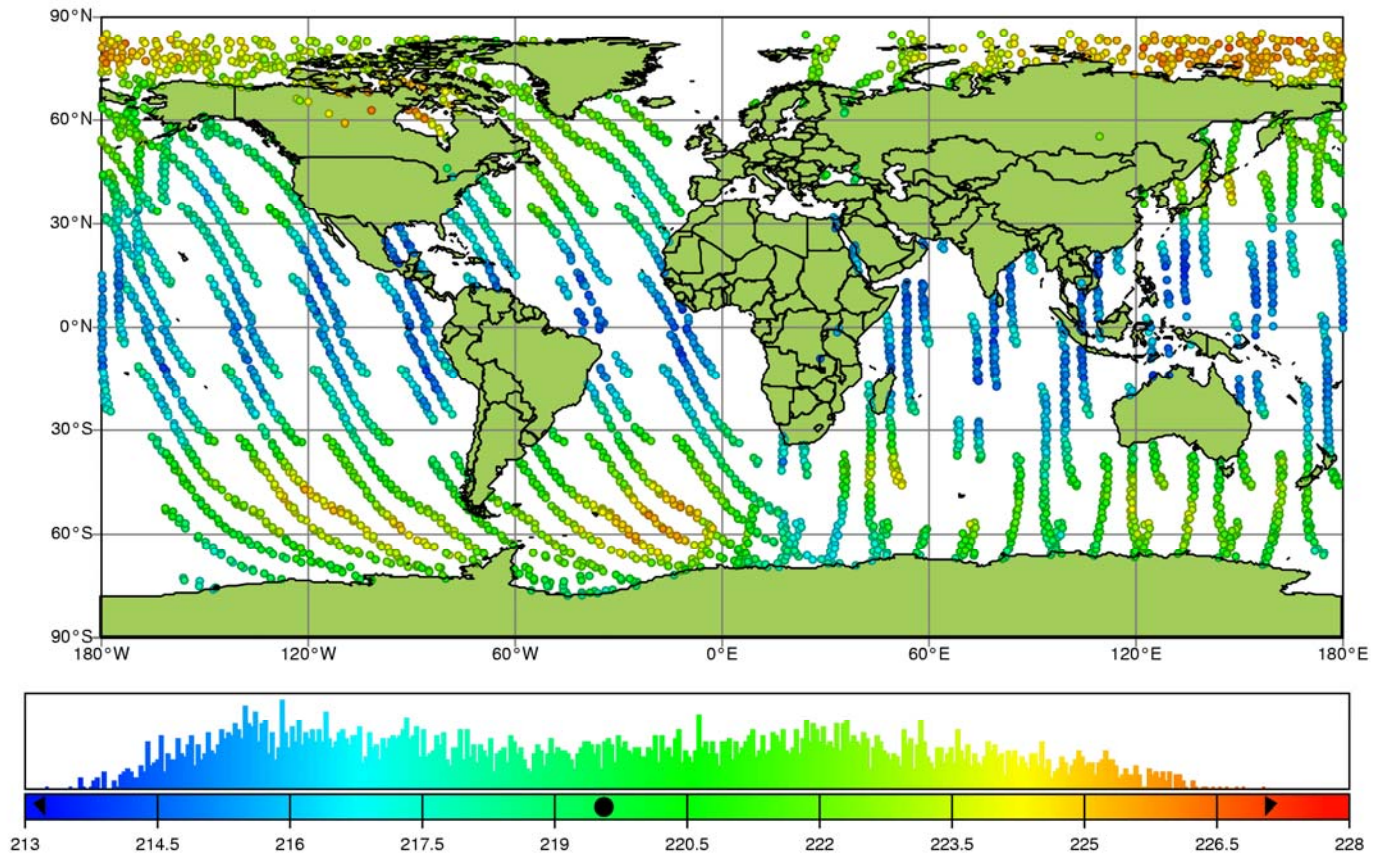
### Foreign broadening coefficients at 296 K and 1013 hPa



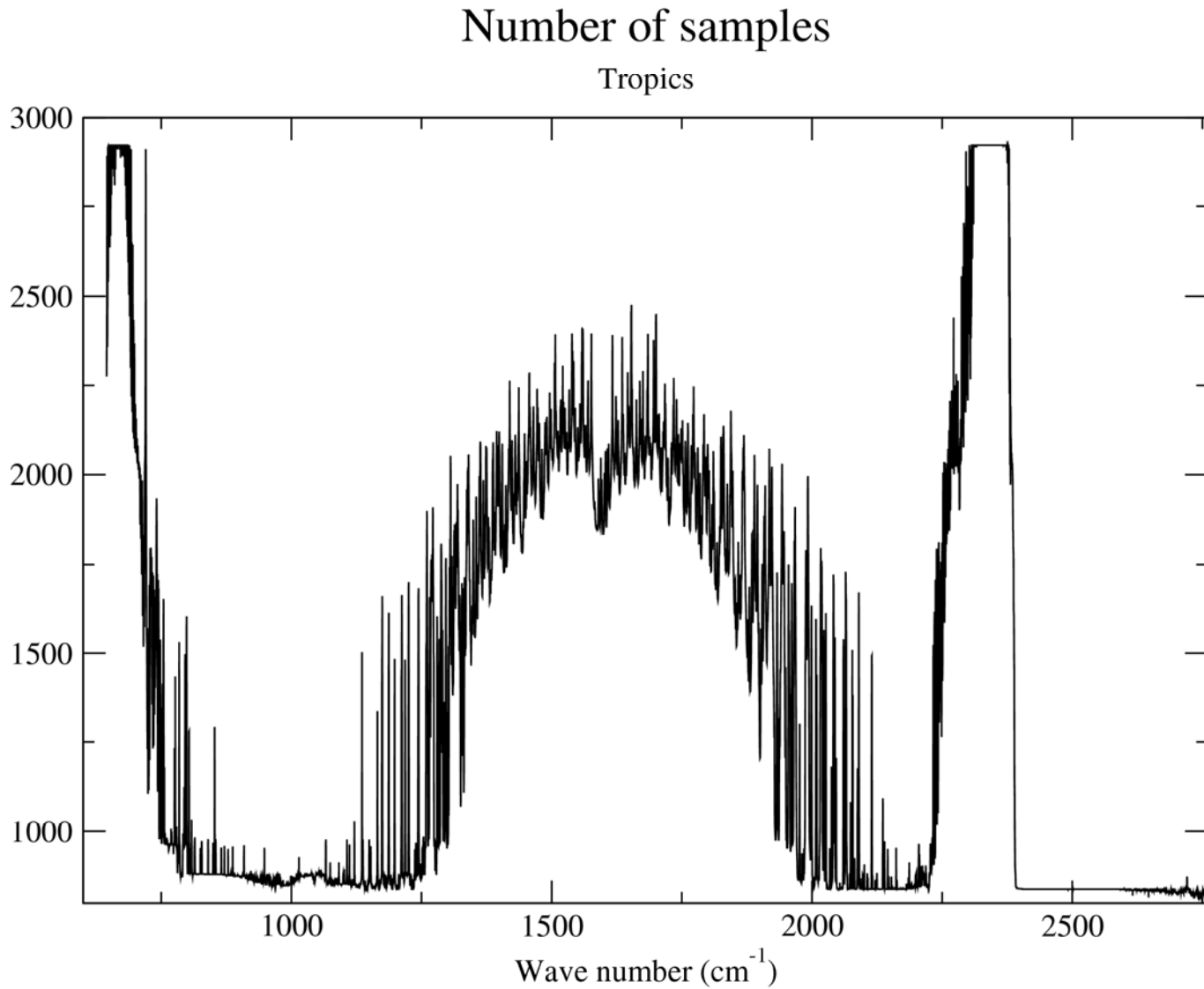
# Models versus observations



ODB: rd/f0ga/2008040100/CCMA  
SQL: /home/rd/stm/ODB\_SQLs/General/iasi\_test.sql (obsvalue@body : 3946 observations)



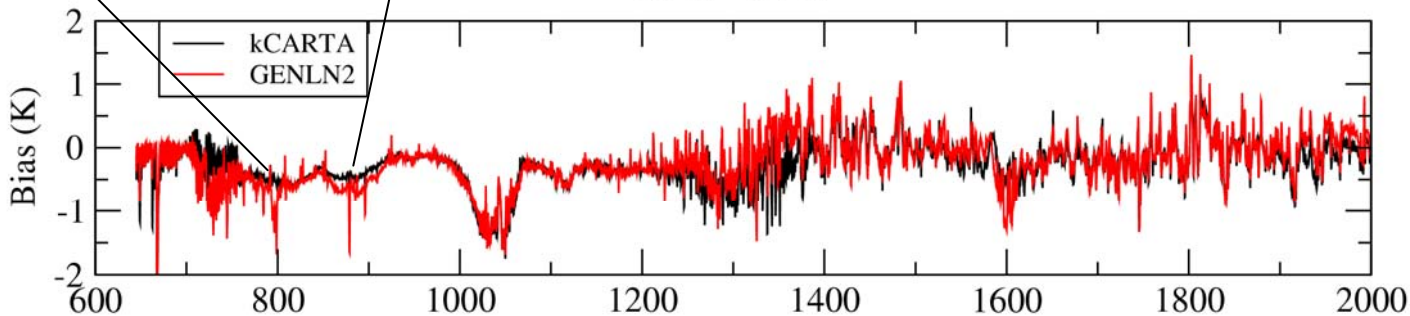
# Models versus observations



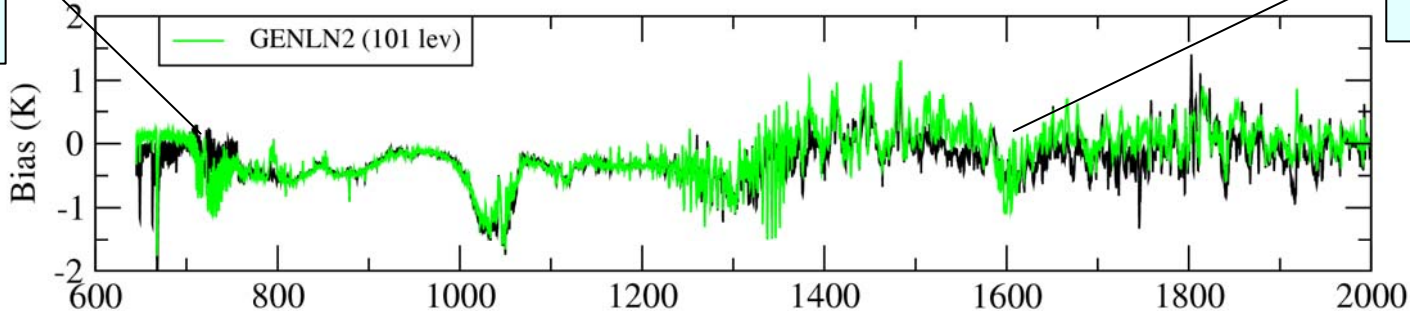
CCI<sub>4</sub>

HNO<sub>3</sub>

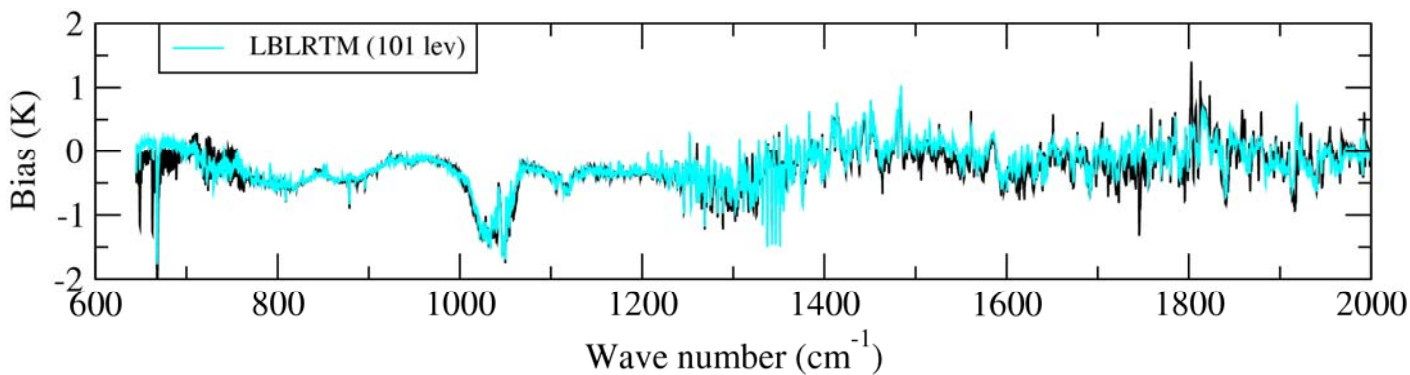
30° N - 90° N



CO<sub>2</sub> P/R  
branch  
Line mixing

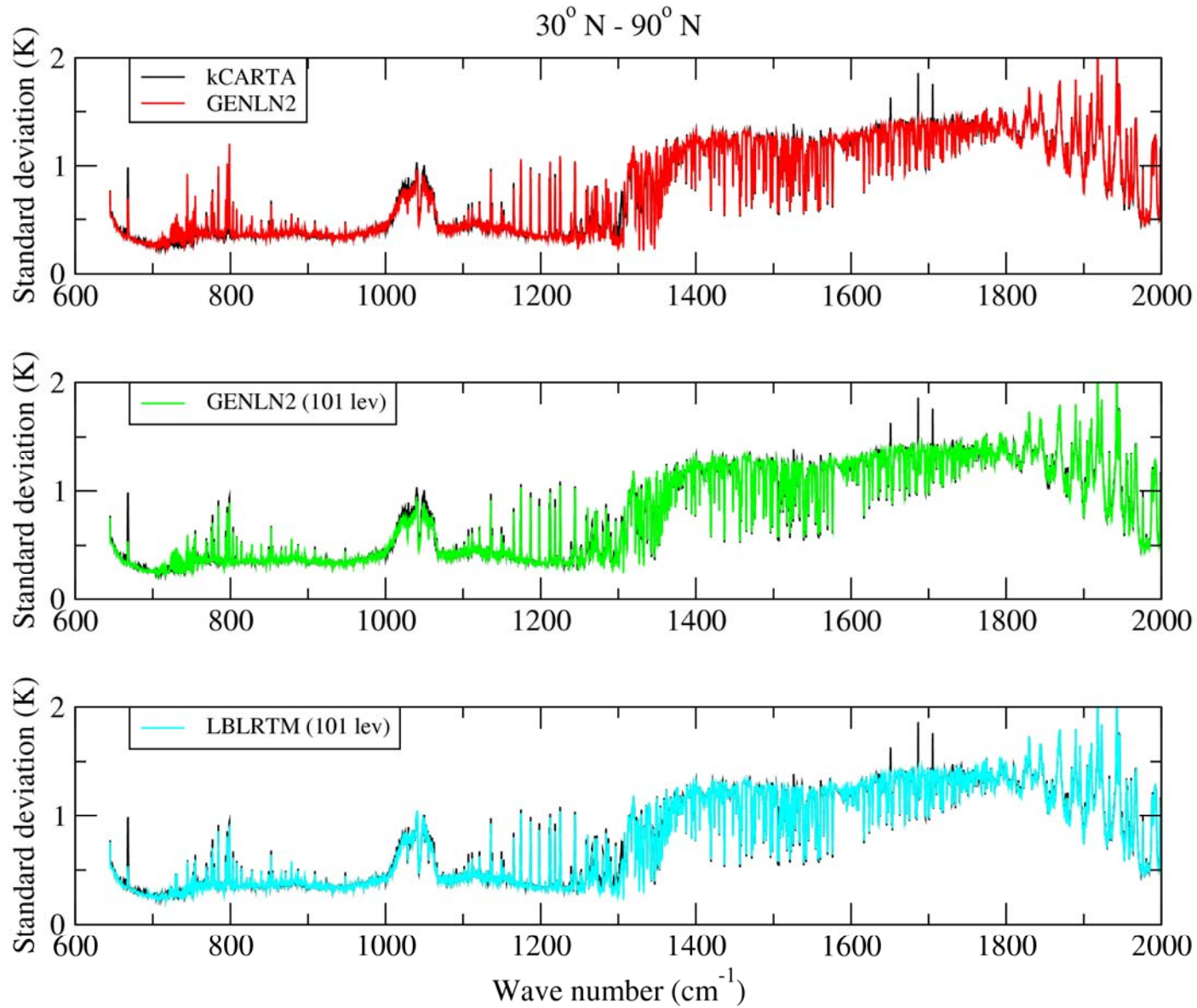


Water  
continuum



Wave number (cm<sup>-1</sup>)

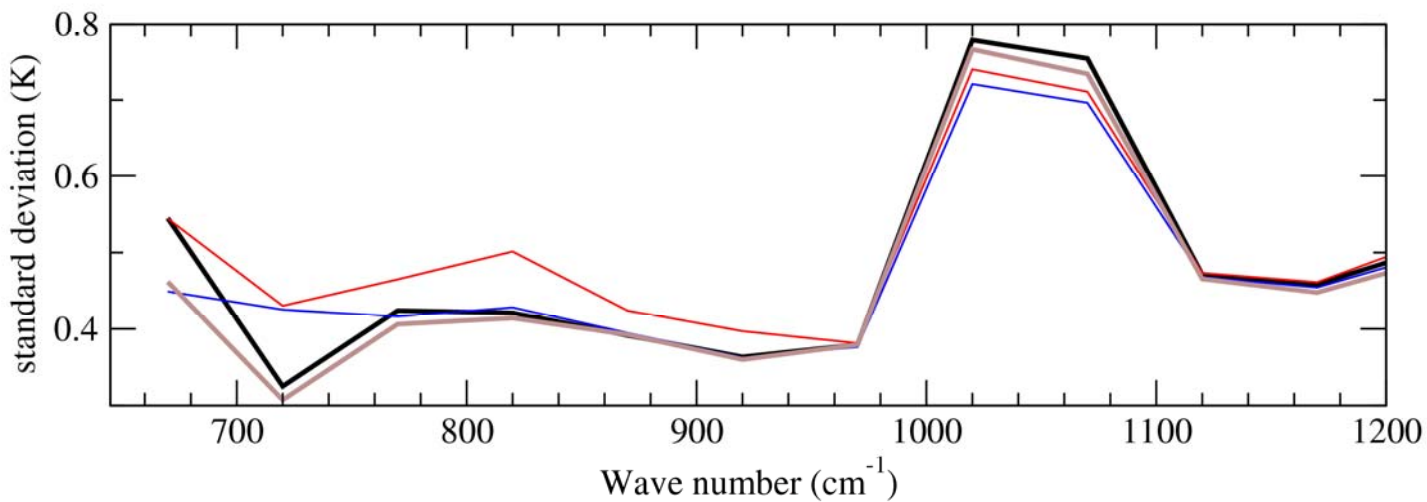
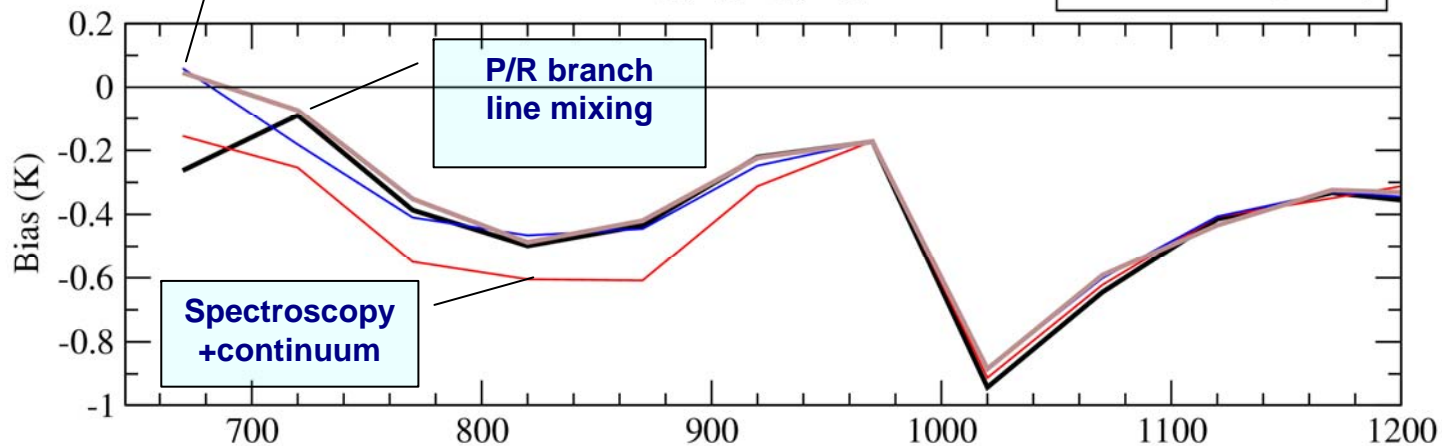




Binned departures

RTTOV9:  
more layers

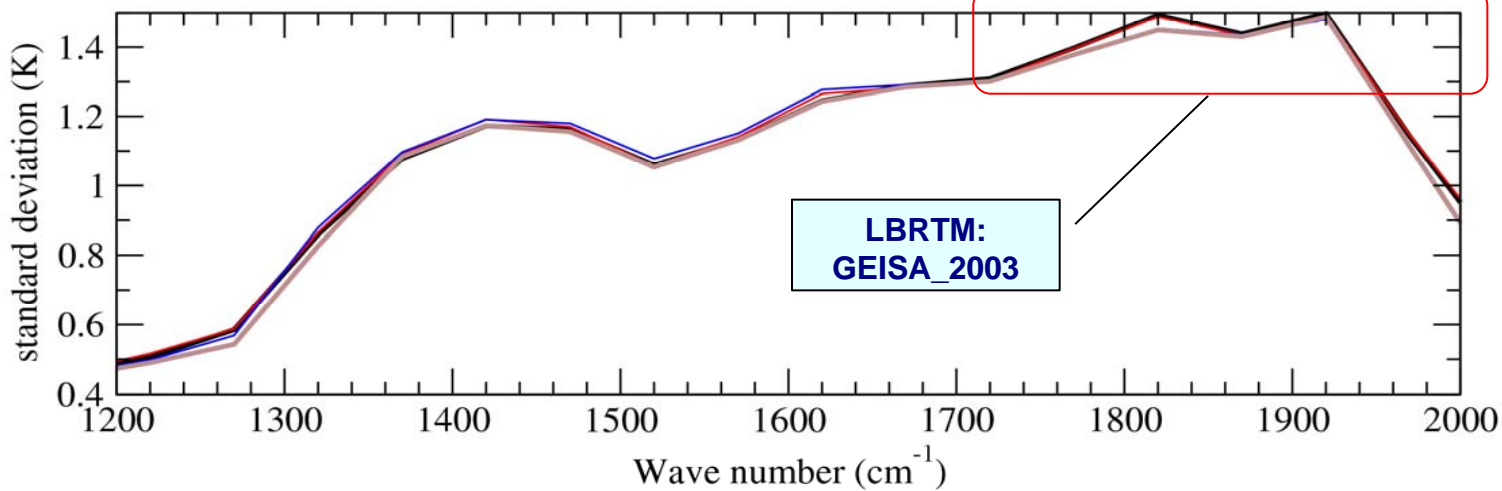
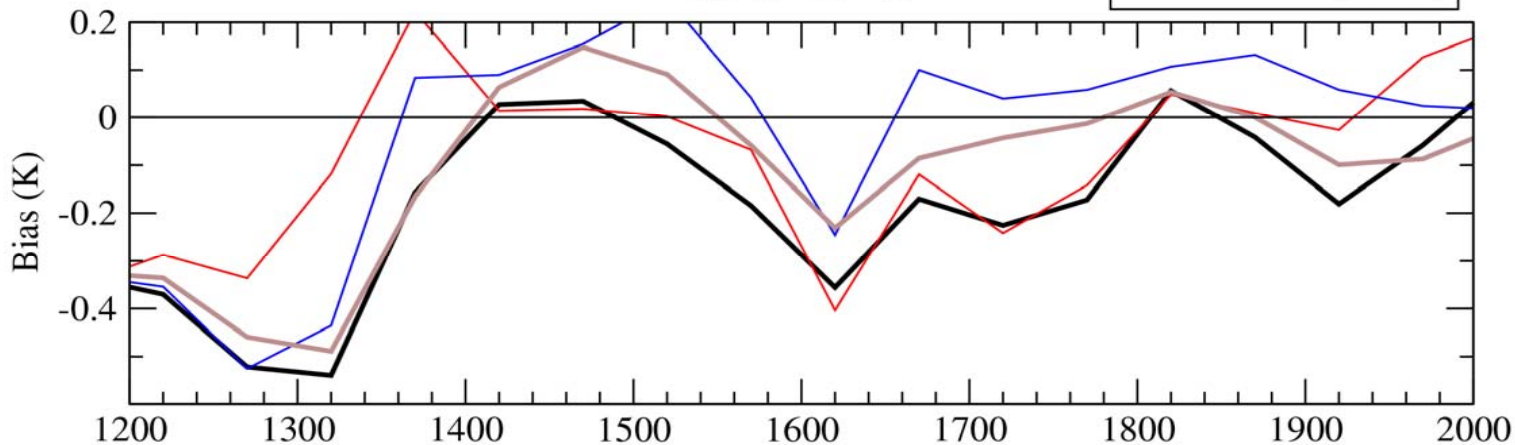
IASI Band 1  
30° N - 90° N



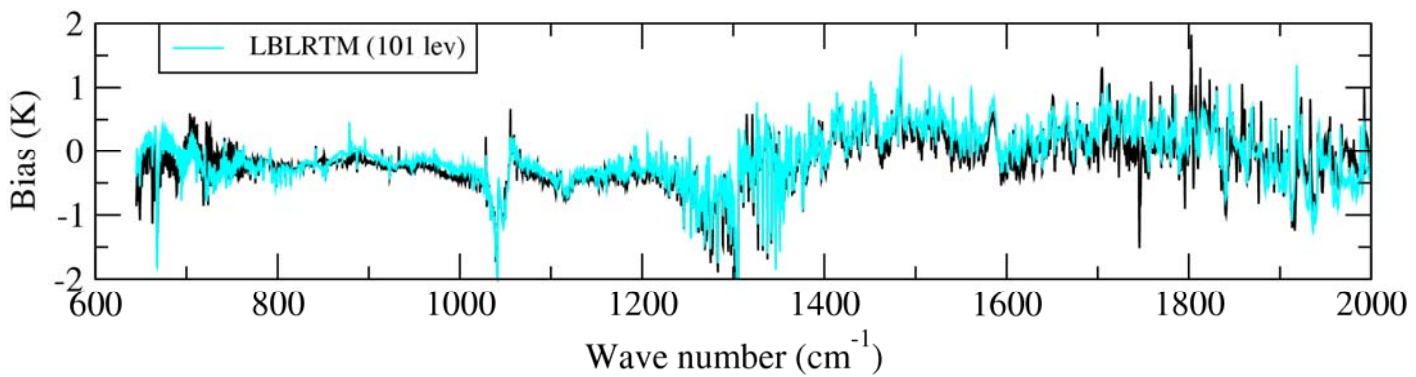
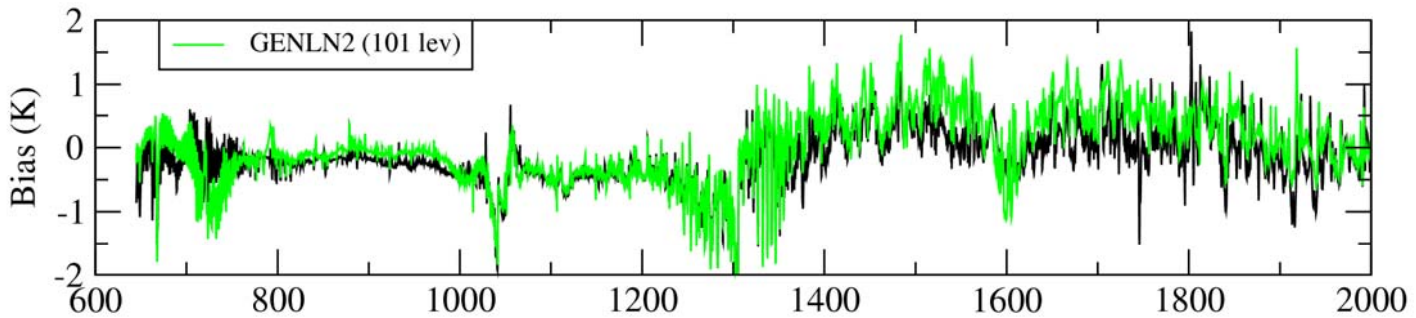
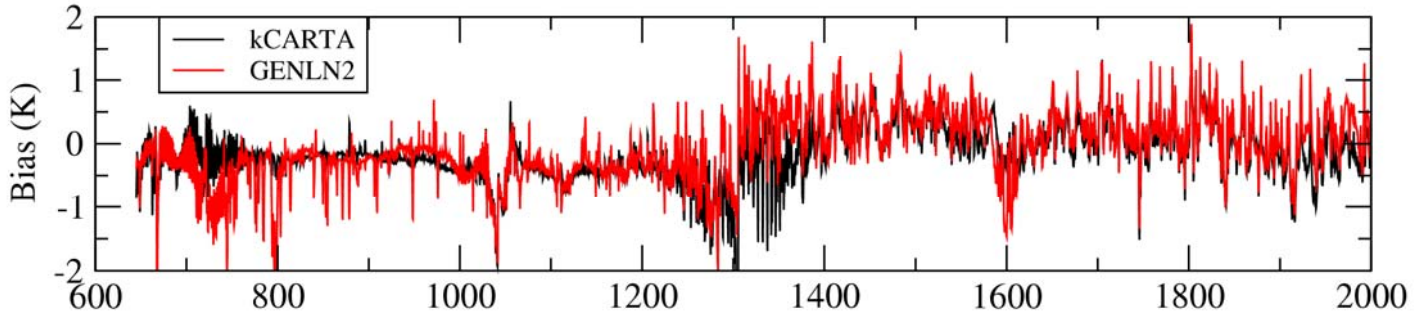
Binned departures

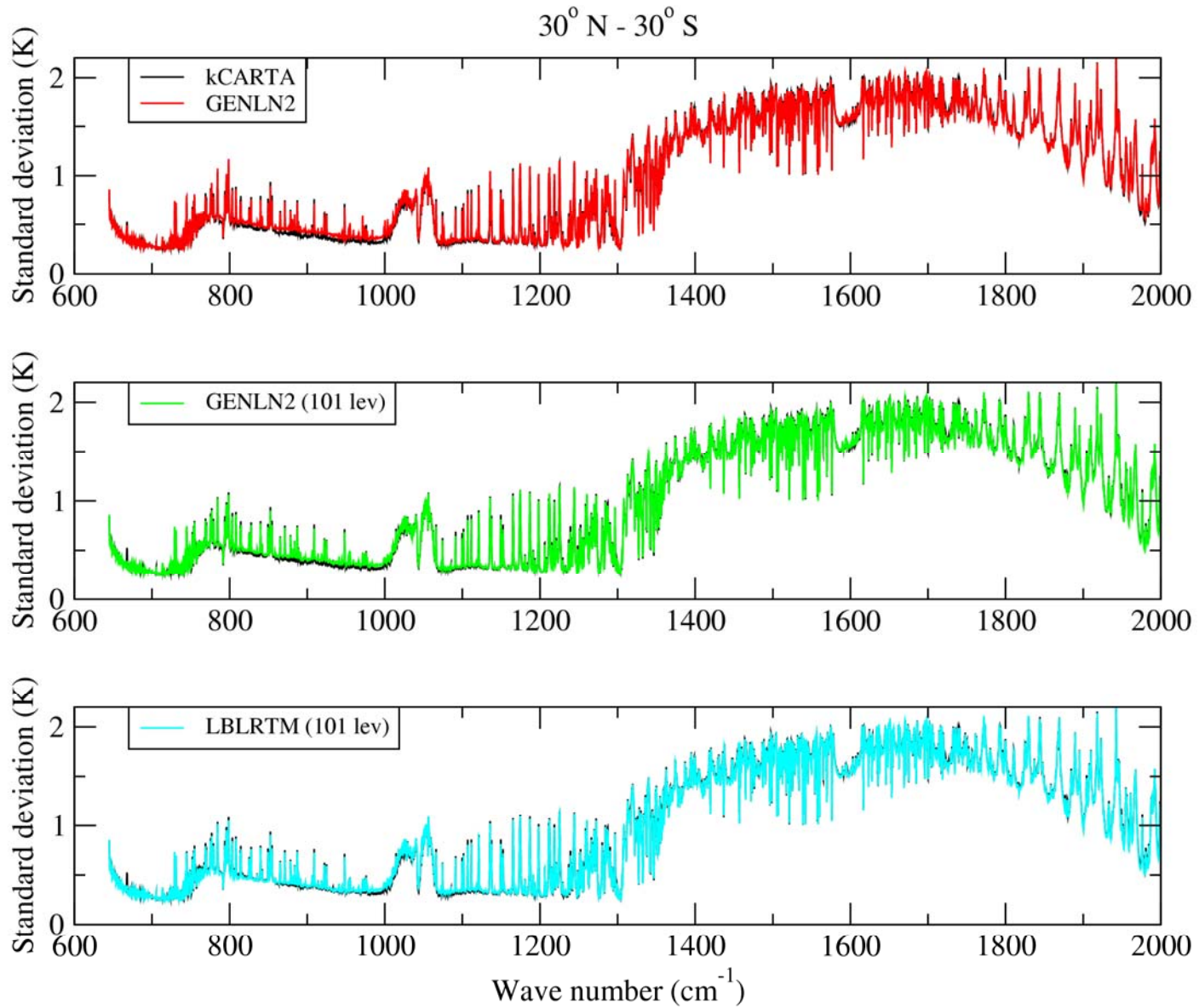
IASI Band 2  
30° N - 90° N

- kCARTA
- GENLN2
- GENLN2 (101 lev)
- LBLRTM (101 lev)



30° N - 30° S

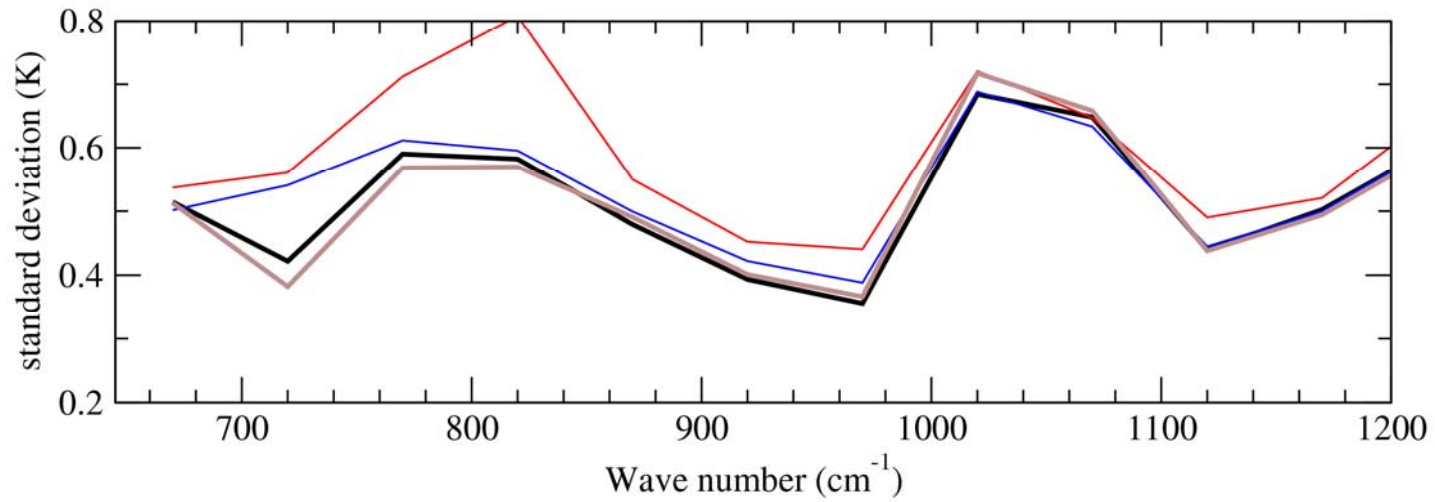
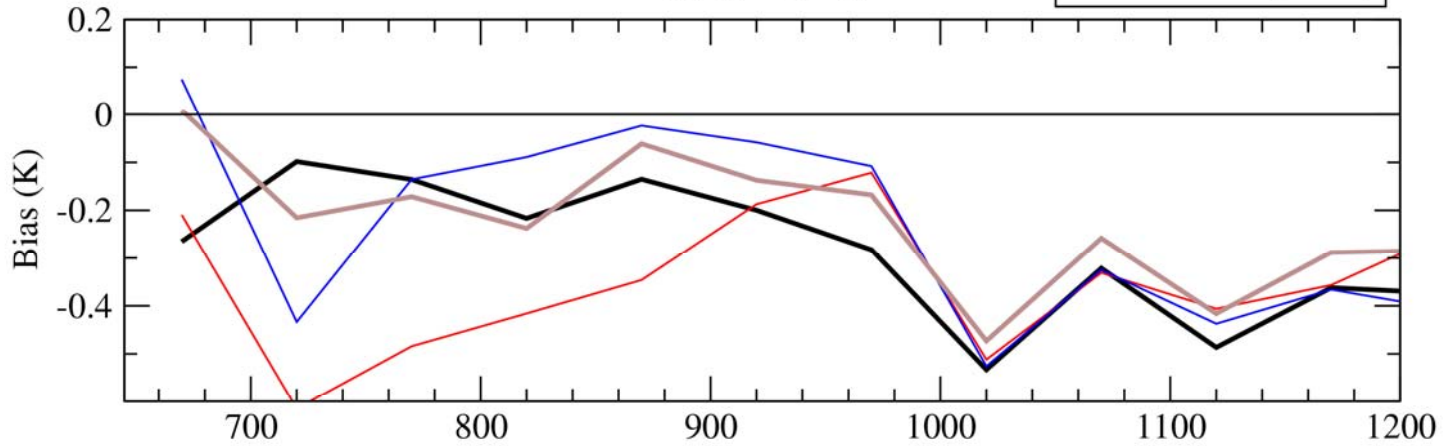




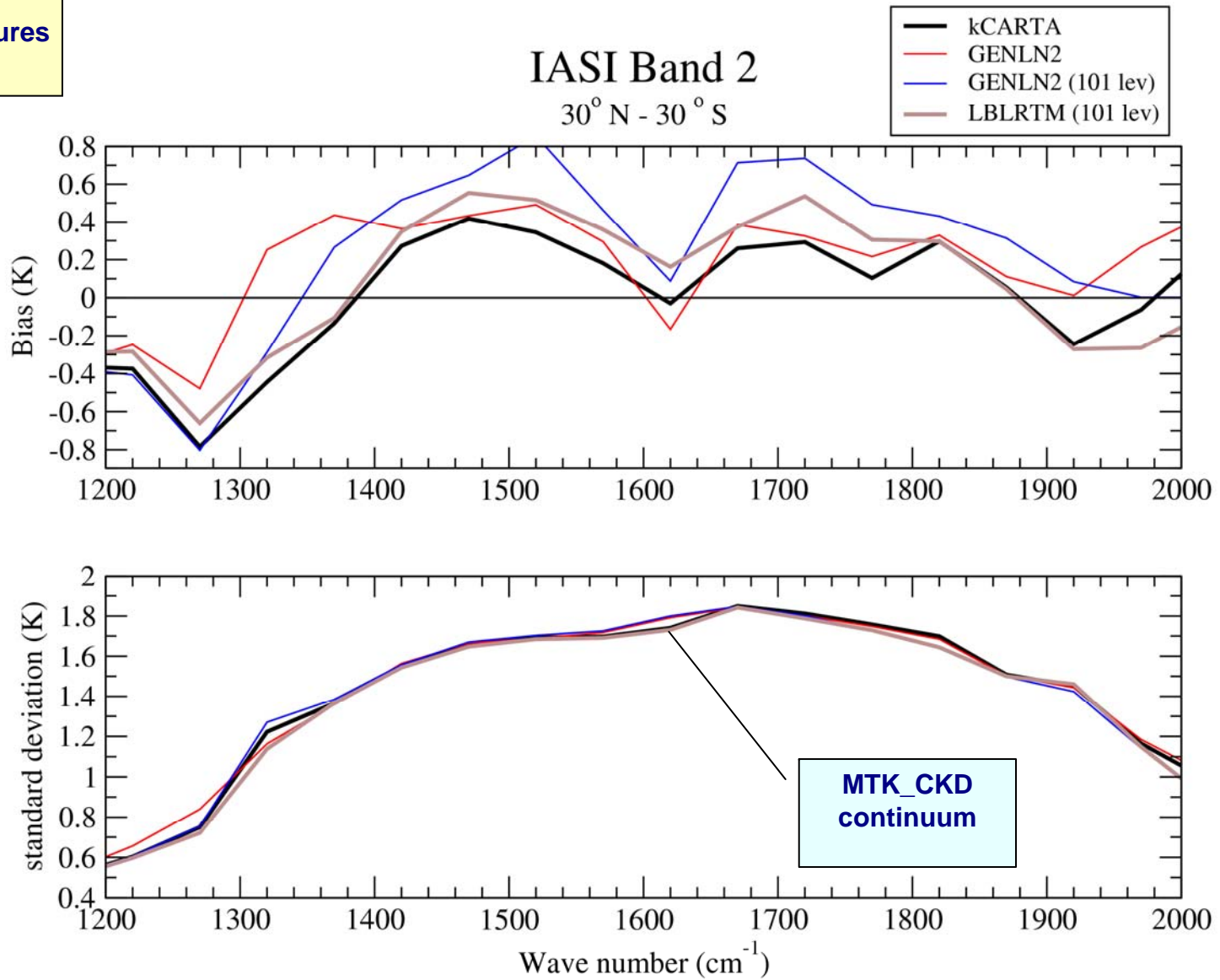
Binned departures

### IASI Band 1 30° N - 30° S

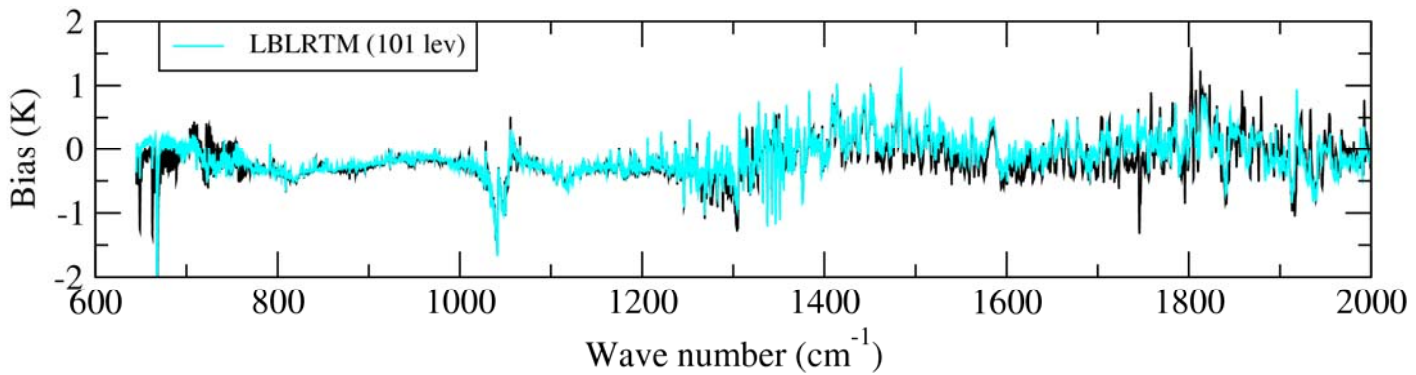
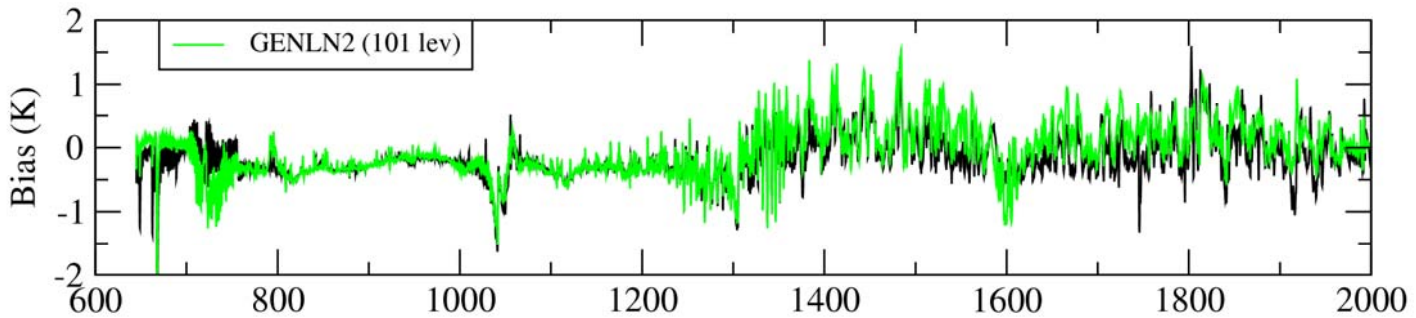
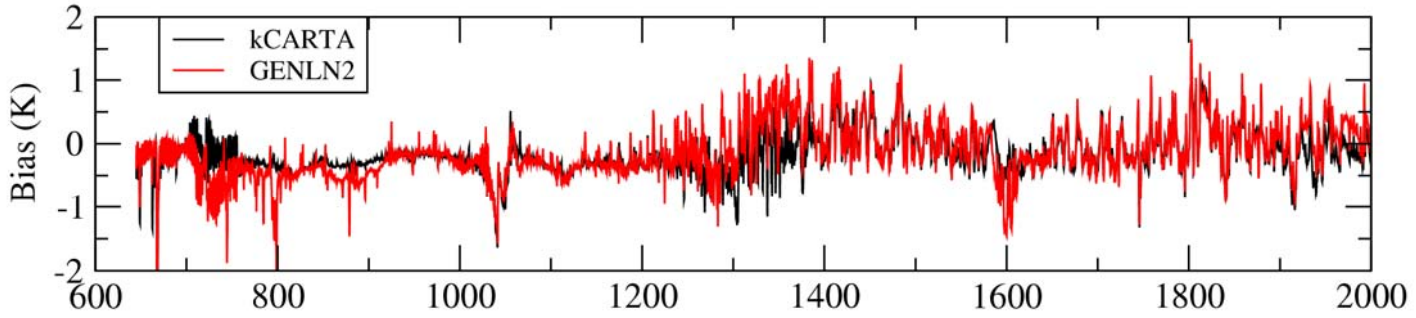
- kCARTA
- GENLN2
- GENLN2 (101 lev)
- LBLRTM (101 lev)



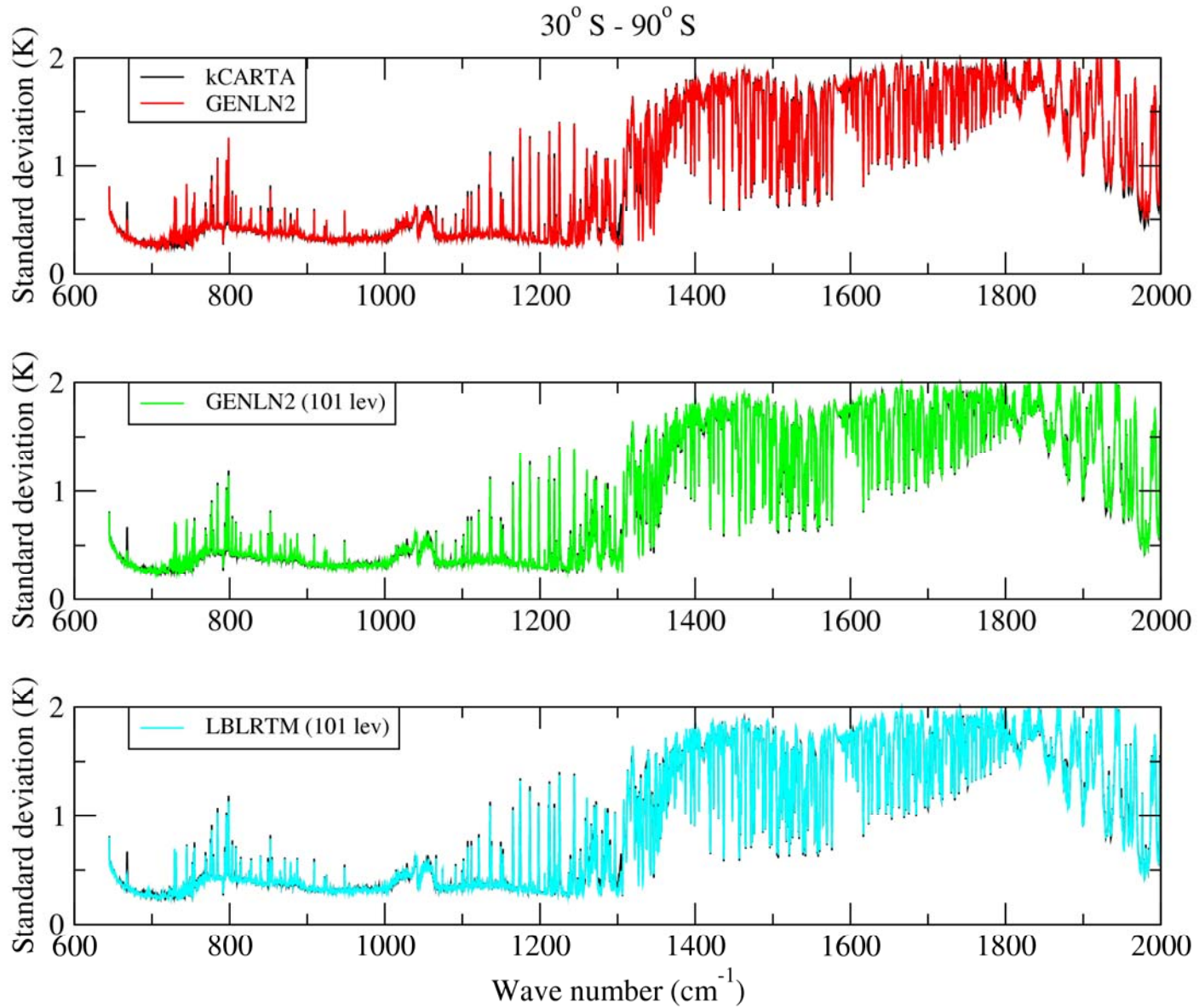
## Binned departures



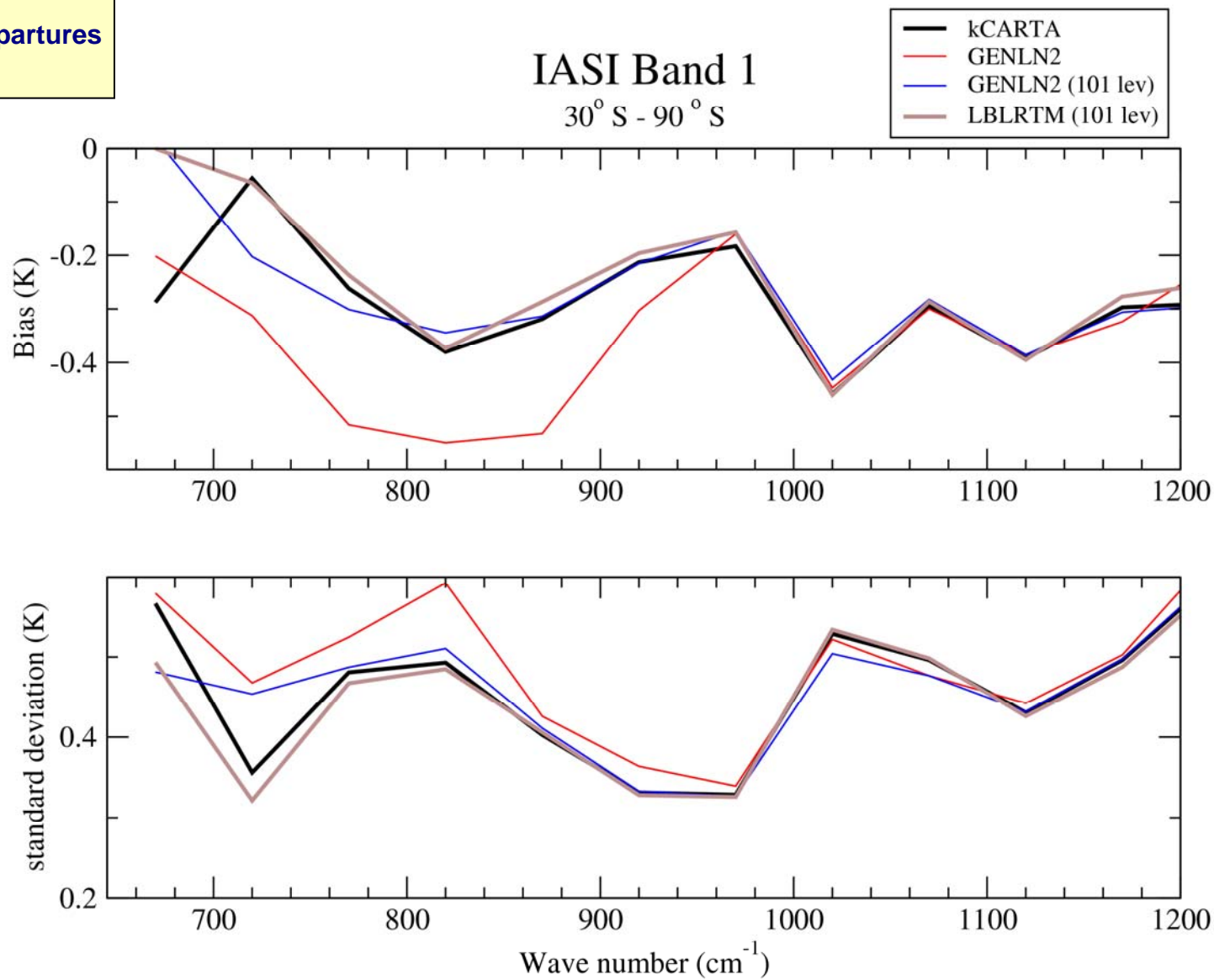
30° S - 90° S







Binned departures



Binned departures

