Current status on temperature bias trends from AIRS compared to operational radiosondes

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With thanks to Evan Manning,
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Procedure

- Select better quality sondes from PREPQC files
  - Per Kevin Yau's recipe on PREPQC quality flags
- Find AIRS matchup profiles
- Interpolate radiosonde temperature to AIRS gridding
- Use AIRS first guess and averaging kernel on radiosonde to create "kerned" radiosonde profile:

$$x_T^* = x_0 + A(x_T - x_0)$$

Procedure continued.

- Due to loss of /archive for ~10 days, not all AIRS matchups+Prepqc files processed in time for meeting. Still work to do!
- These analyses use the 5th day of each month (5th, 10th, 15th …30th) to create monthly bias trends. Time used is launch through 2007.
- Monthly bias trends are averaged to produce yearly trends on latitude bins.
  - Some latitudes have comparatively few sondes processed.
- Only land observations processed now.
- Ship-based sondes will be processed later.

Temperature bias trend

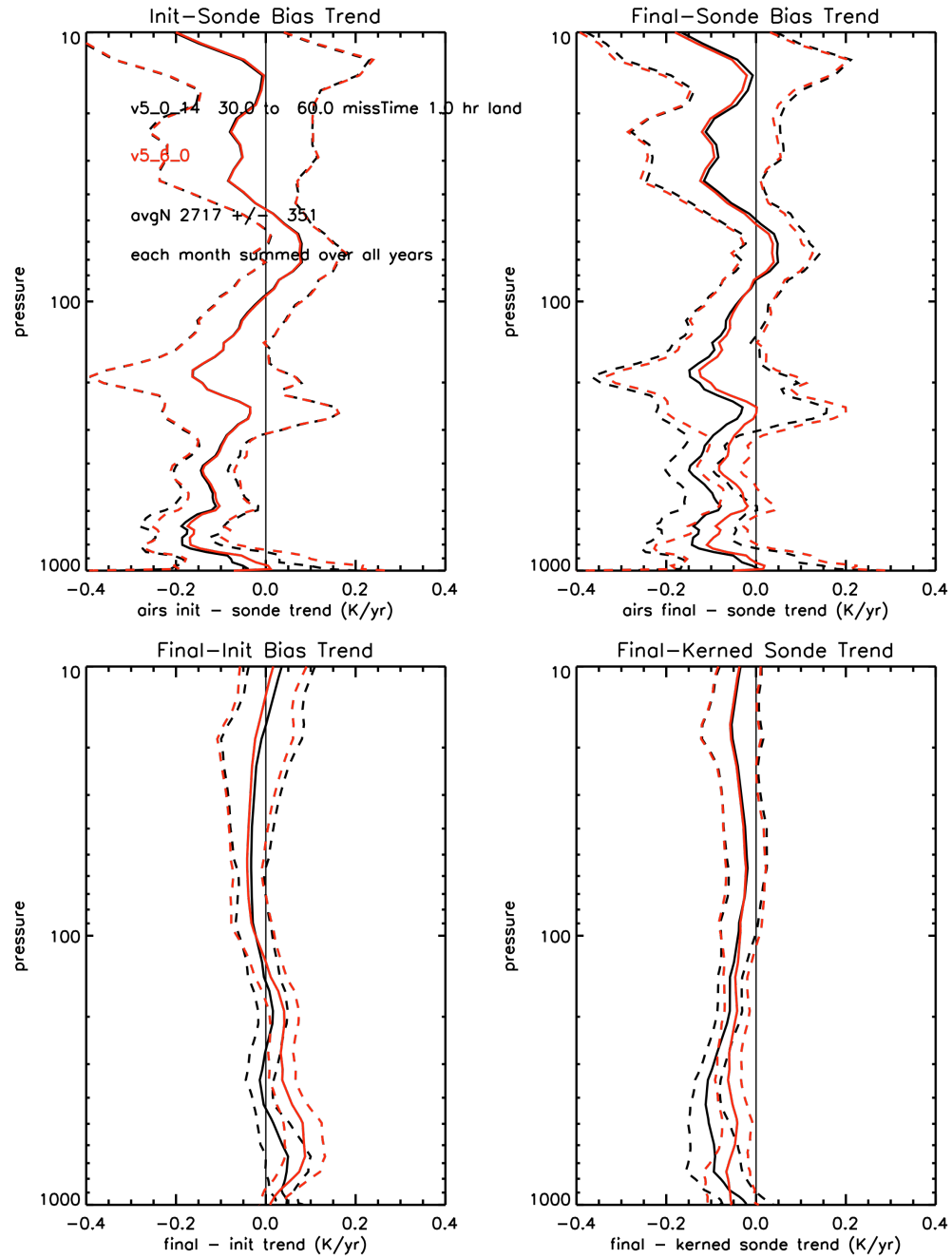
Black lines – V5
Red lines – V6 prototype
Dashed lines – error in slope

Temperature qual flags<=1
Land only, 30°N – 60°N

±1 hr maximum miss time from sonde launch

100 km maximum miss distance

(avgN = avg obs for a month totalled from 9/02 to 12/07).



Temperature bias
30°N – 60°N
Apr, May, Jun 2006

Black lines – V5

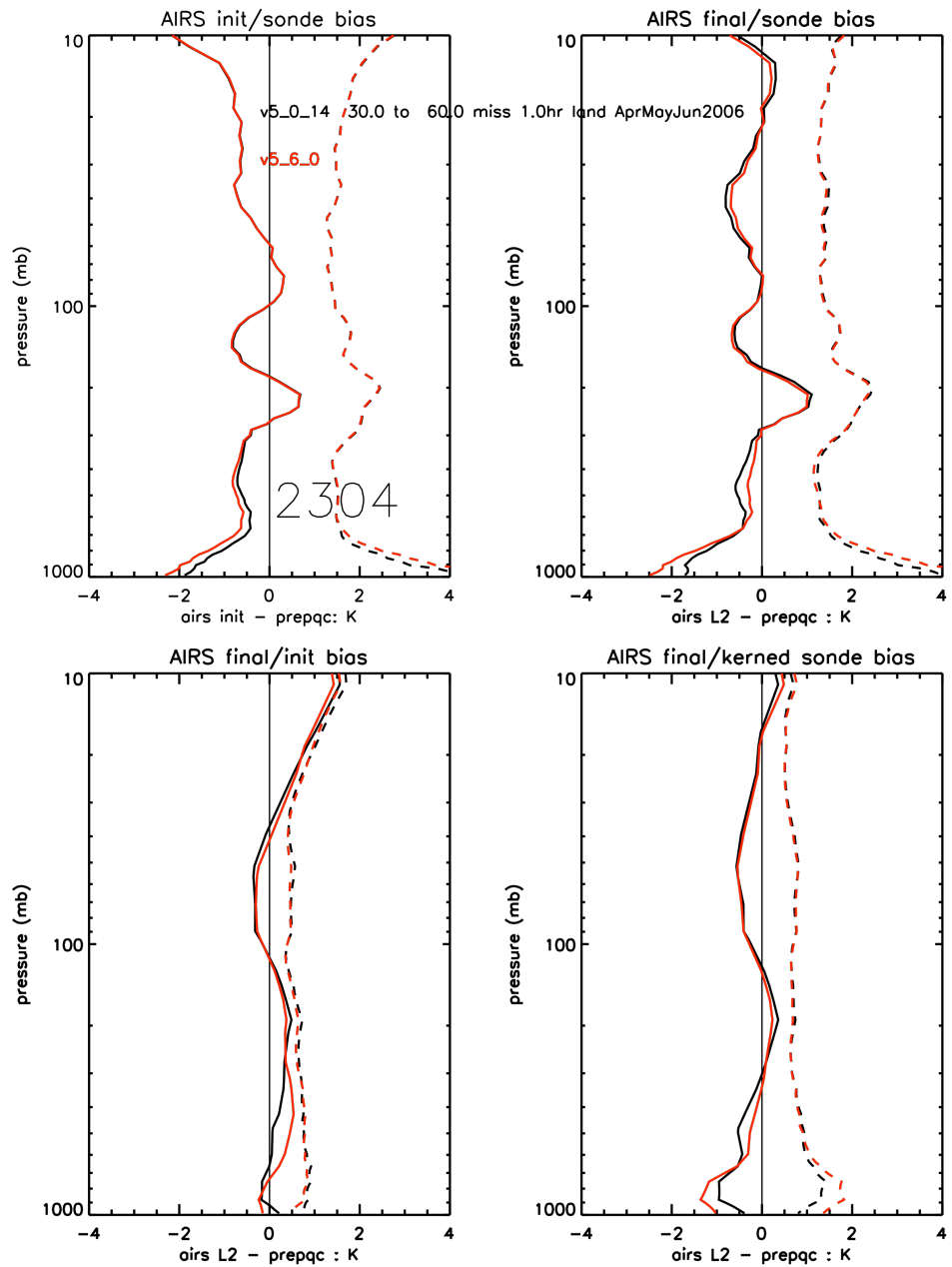
Red lines – V6 prototype

Dashed lines – RMS

Land only

±1 hr maximum miss time from sonde launch

100 km maximum miss distance



Summary

- Regression/First-guess imposes a time-dependent bias going into the physical retrieval
  - This forces the physical retrieval to work harder than it needs to?
- Improvement seen from V5 to V6 prototype in zonal mean bias trend
  - Still need to break it down by non-frozen ocean, warm-season land, cold-season land, polar winter
- Stay tuned.

Thank you
These are my dogs.