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**Jet Propulsion Laboratory**  
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# Plans for Validation of Version 5

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**AIRS Science Team Meeting, Pasadena, CA**

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## Thanks to all the authors of validation papers to date (and apologies to those I've missed...)

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## Thanks to all the authors of validation papers (continued)

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## Current validation status

- **Radiances are very well characterized.**
- **T and q over ocean meet 1 K / km, 15% / 2 km, even locally.**
- **Well characterized T and q over warm season land; 1 K/km and 15% / 2 km in the free troposphere.**
- **Minor gases in the free troposphere.**



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## ***But...We Need Better Insight into Some Quantities***

- **Temperature and humidity**
  - *vertical resolution, sensitivity and uncertainties.*
  - *the boundary layer over land and poles.*
- **Cloud climatologies against ISCCP, MODIS and models.**
- **Long term *weather* variability compared to reanalyses.**
- **Minor gas information content.**
  - *How we complement minor gases from other A-Train sensors.*
- **Sampling biases in *many* variables.**



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# Our Validation Schedule as of September 2003

## AIRS PRODUCT VALIDATION TIMELINE

Product	Version	3.0	4.0	5.0	6.0	7.0	8.0
	Activation Date	Aug 03	Sept 04	Jun 05	Mar 06	Dec 06	Sept 07
Level 1B Radiances	AIRS Radiance	Prov	Val2	Val4	Val5		
	VIS/NIR Radiance	Prov	Val2	Val4	Val5		
	AMSU Radiance	Beta	Prov	Val2	Val4	Val5	
	HSB Radiance	Beta	Prov	Val2	Val4	Val5	
Level 2 Standard Product	Cloud-Clear IR Radiance	Beta	Val2	Val3	Val4	Val5	
	Surface Temperature	Beta	Val2	Val3	Val4	Val5	
	Temperature Profile	Prov	Val2	Val3	Val4	Val5	
	Humidity Products	Beta	Val1	Val2	Val3	Val4	Val5
	Cloud Cover Products	N/A	Beta	Val1	Val2	Val2	Val3

**Beta** = Not suitable for scientific investigations. Consult with AIRS Project on regional status.

**Prov** = Provisionally validated. Useable for scientific investigations with caution. Validated for nonpolar night ocean only

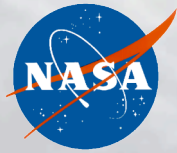
**Val1** = non-polar day/night ocean

**Val2** = Val1 + non-polar night land

**Val3** = Val2 + nonpolar day land

**Val4** = Val3 + polar night

**Val5** = Val4 + polar day. Only Val5 data are useable for truly global scientific investigations.



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# *Generally:* We are data rich, analysis poor

## **We have:**

- **Over 4 years of AIRS observations.**
- **Correlative data sources**
  - *ECMWF and NCEP reanalyses.*
  - *Thousands of operational and dedicated sondes*
    - Europeans, ARM, field campaigns including Aura validation.
  - *Field campaigns for several minor gases.*
  - *Similar observations from the A-Train*
    - H<sub>2</sub>O, O<sub>3</sub>, CH<sub>4</sub> and CO from TES and MLS.
    - Cloud properties from CloudSat, MODIS, MLS and AMSR.





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## Short-term goal: A Validation Plan

- **The next round of AIRS validation studies *must* be published, not just reported.**
  - *We are not planning another Special Section; publish at will.*
  - *Please keep me (at least) informed of what you're doing.*
- **Primarily science driven**
  - *What do we need to know to answer the “twenty questions”?*
  - *How do we improve the science analyses presented earlier?*
- **Finish the plan by the end of April**
  - *It may just be a list of analyses / analysts.*
- **Comments on priorities are welcome.**



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## Some topics for science analyses using validation data

**More topics are welcome; volunteers are needed:**

- **Land T and q in the boundary layer using dedicated sondes, (Tobin, Hearty).**
- **Polar water vapor and temperature (Tobin, Walden, Ye).**
- **Sampling biases (Hearty, Fishbein, Fetzer, Divakarla?, Tobin?).**
- **Ozone (Irion, Divakarla).**
- **Other minor gases (defer to Wallace and Bill here).**
- **CloudSat comparisons (Kahn).**
- **Land surface temperature (Knuteson).**



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## Some Topics for science analyses using validation data (continued)

- **Surface exchange processes (Santanello & many others).**
- **Error estimates, averaging kernels, vertical resolution (Suskind, Irion).**
- **Profiles over stratocumulus (Teixeira, Fetzer)**
- **Upper trop humidity with dedicated sondes (Voemel, others?)**
- **Assess L3 against ECMWF (Granger).**
- **Minor gas comparisons against other A-Train sources (McMillan, Irion)**
- **Tropopause structure (Tian, Fetzer).**



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# Finally...

- **All ideas and plans are welcome.**
- **Every contribution is valuable!**