



National Aeronautics and  
Space Administration

**Jet Propulsion Laboratory**  
California Institute of Technology  
Pasadena, California

# AIRS V6 Development Status

(Perseverance Counts!)

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**AIRS Science Processing**

**May 4, 2009**

*This work was carried out at the Jet Propulsion Laboratory, California Institute of  
Technology under a contract with the National Aeronautics and Space Administration.*

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## V6 Status in a Nutshell

- **V6 development has been very challenging**
  - Several V5 issues were identified as
    - Yield and coverage
    - Surface parameters
    - Trends over time
  - Recent work shows promise (topics will be covered today)
  - While work still remains to be done, we are achieving most top-level goals
  - Wrap-up V6 work by end of year
  - Deliver V6 to GES DISC in series of phased deliveries



## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
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### Level 1B

Improve Spectral Calibration	Nearly Complete	Algorithm Understood Currently prototyping, testing <i>(presentations by Strow and Manning)</i>	September
Channel Properties Enhancement (Dynamic)	Conceptual design completed	No change Defer this work	V7
New Radiometric Calibration Coefficients	(Undiscovered)	New work Still evaluating impact on <i>(presentations by Weiller)</i>	September

## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
<b>Level 1C</b>			
Remove spectral artifacts found in L1B products. (Include filling channels for detectors out of range.)	In process	Prototyping concepts completed: Cleaning alg. being converted to C Spectral shifting algorithm delivered Frequency shift determination work still in process <i>(presentations by Strow and Manning)</i>	September

## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
<b>Level 2</b>			
Bias Trend Removal (remove bias trend over time in mid- Trop temp. water vapor.	Contributing factors known, but not well understood: CO <sub>2</sub> , N <sub>2</sub> O, cloud-clearing frequency shifting regression  No solution defined, identified as major research topic	Replacing regression-based first-guess with climatology shows promise  Still need to evaluate Neural Net approach  Other retrieval inputs have helped near surface  <i>(presentation by Manning)</i>	October

## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
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### Level 2 (cont'd.)

Improve Boundary Layer Sensitivity	Added new CC channels	Some improvement due to improved surface handling, but additional work still being completed for integration at JPL <i>(presentation by Suskind)</i>	October
Retrieve Surface Emissivity	Work completed, but not integrated	Code delivered and integrated into L2. Ready for testing. <i>(presentation by Suskind)</i>	Delivered

## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
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### Level 2 (cont'd.)

Yield Improvement in Critical Areas	Some improvement, more work needed. Code not integrated.	Code prototyped at GSFC but not integrated into baseline code at JPL.  <i>(presentation by Suskind)</i>	Delivered
Improve Error Estimation	No improvement to date	Issue remains open	TBD
RTA Improvement - CO <sub>2</sub> , variable frequencies, trace gases, dust	Algorithmic work completed	RTA code complete, but still needs to be integrated into L2.  TBD who will do this.  <i>(presentation by Strow)</i>	TBD

## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
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### Level 2 (cont'd.)

Improve OLR computation	In process at GSFC using AER code	Code completed and delivered to JPL  Currently being integrated at JPL	TBD
Add Cloud and Dust Retrievals	Identified spurious cases at GSFC, but still refining  No other cloud retrieval work  Dust retrieval deferred until V7	Correction of spurious cases integrated into L2.  Cloud retrievals deferred to V7	V6 code delivered

## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
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### Level 2 (cont'd.)

Retrieve Mid-Tropospheric CO2	Prototype post-L2 CO2 retrieval demonstrated	CO2 products will be included in V6 as Post-L2 PGE.  Final coding being done.  <i>(several presentations on CO2-related topics)</i>	September
Mitigate (Potential) Loss of AMSU-A  Improve IR-Only Retrieval  Continue to use good AMSU channels	Work not begun	IR-Only retrieval QC and error prop improved  Better handling of failed microwave channels  <i>(presentation by Suskind)</i>	Delivered

## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
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### Level 3

Reduce Sampling Bias Effects	Concepts under development	Concepts still under development  <i>Level 3 will be delivered in 3rd and final phase of V6 deliveries</i>	Early 2010
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## V6 Status Summary

Feature	Status October 2008	Current Status	Completion Estimate
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### Version 6 Testing

<p>Improve V6 Testing Methodology at JPL. Test the harder cases.</p>	<p>Not worked</p>	<p>New testing methodology developed.  <i>- Not based on direct comparison of results to ECMWF</i></p> <p>Additional work needs to be completed on selecting special-case test areas  <i>(presentation by Irion)</i></p>	<p>Summer '09</p>
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## V6 Development Report Card Assessment

- **Key priority items for V6 still need to be worked**
  - Level 1B and Level 1C nearing completion
  - Level 2
    - Many goals have been met
    - Other desired features still under development
  - Level 3 work has not really begun
  - New testing methodology must be “tested”
- **V6 status much improved when compared to status at our last (October 2009) Science Team Meeting**
- **Key issues remain**

## V6 Development Report Card Assessment (cont'd.)

- **Key issues remain to be resolved: science and programmatic**
  - **Science Issues**
    - Confirm bias trends over time have been improved to acceptable levels
    - Confirm retrieval is robust enough to handle failure of AMSU-A Channel 5, other AMSU-A channel failures
  - **Programmatic Issues**
    - Integration of UMBC RTA code into L2
- **Other development, based on concepts we think we understand, must be completed quickly**
- **To meet these goals, it is imperative that all V6 work by Science Team be wrapped up in the next 3 months**

## Wrapping-Up V6 Final Development Milestones

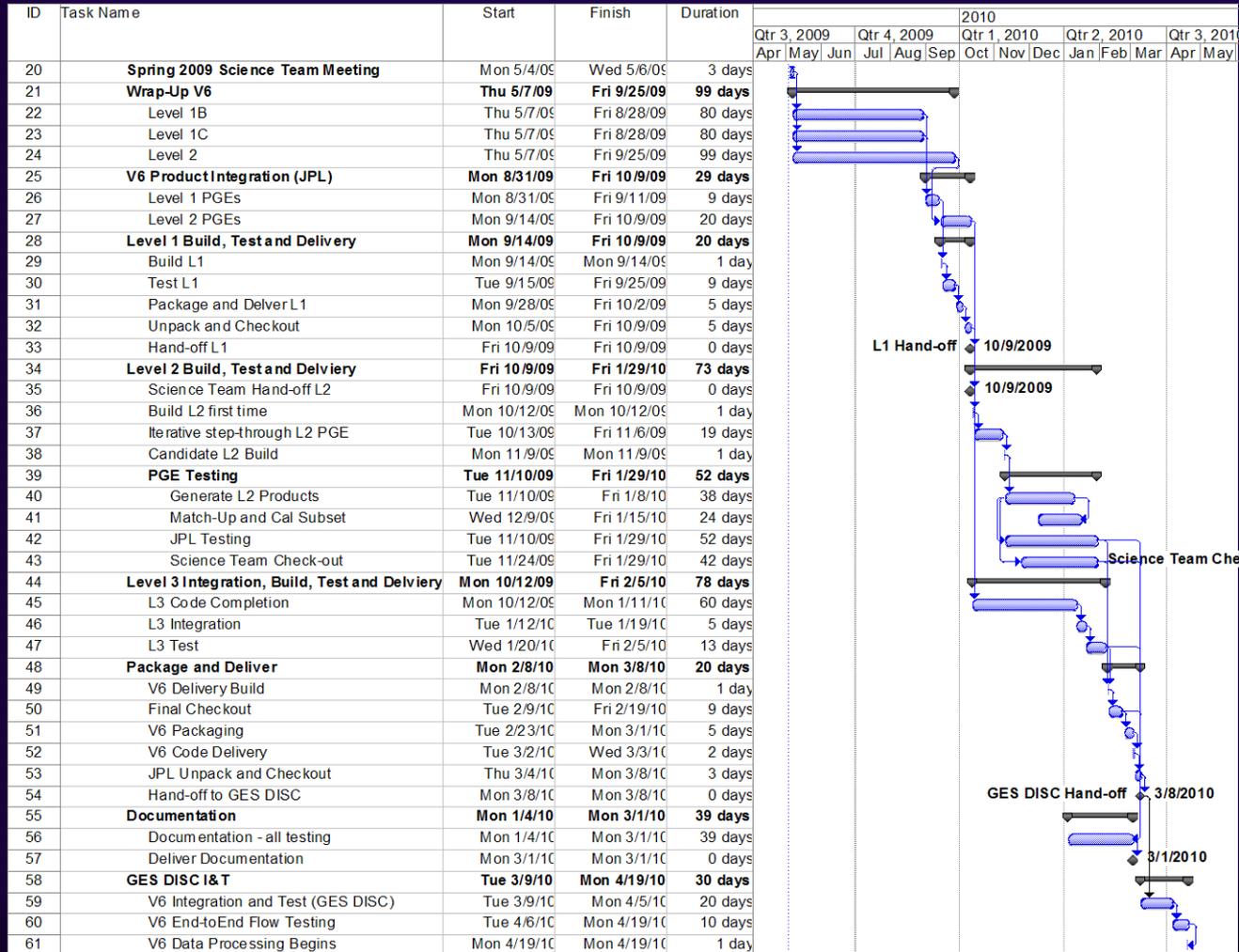
- V6 development will continue throughout the summer
- Levels 1, 2 and 3 will be completed in stages
  - Level 1B and Level 1C code SEP
  - Level 2 - basic end-to-end algorithm OCT
  - Level 2 - integration and testing OCT - NOV
  - Level 2 - final QC, error states, ... NOV
  - Level 2 - formal testing NOV - JAN '10
  - Level 3 - code and integration OCT - JAN '10
  - Level 3 - test JAN - FEB '10

## V6 Delivery and Operations

- V6 will be delivered to GES DISC and put into production in stages
  - L1 OCT 09
  - L2 + CO2 MAR 10
  - L3 MAR 10



# New V6 Schedule October 2008 Science Team Meeting



# New V6 Schedule October 2008 Science Team Meeting

ID	Task Name	Start	Finish	Duration	2010													
					Qtr 3, 2009			Qtr 4, 2009			Qtr 1, 2010		Qtr 2, 2010					
					Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb			
20	<b>Spring 2009 Science Team Meeting</b>	Mon 5/4/09	Wed 5/6/09	3 days														
21	<b>Wrap-Up V6</b>	Thu 5/7/09	Fri 9/25/09	99 days														
22	Level 1B	Thu 5/7/09	Fri 8/28/09	80 days														
23	Level 1C	Thu 5/7/09	Fri 8/28/09	80 days														
24	Level 2	Thu 5/7/09	Fri 9/25/09	99 days														
25	<b>V6 Product Integration (JPL)</b>	Mon 8/31/09	Fri 10/9/09	29 days														
26	Level 1 PGEs	Mon 8/31/09	Fri 9/11/09	9 days														
27	Level 2 PGEs	Mon 9/14/09	Fri 10/9/09	20 days														
28	<b>Level 1 Build, Test and Delivery</b>	Mon 9/14/09	Fri 10/9/09	20 days														
29	Build L1	Mon 9/14/09	Mon 9/14/09	1 day														
30	Test L1	Tue 9/15/09	Fri 9/25/09	9 days														
31	Package and Delver L1	Mon 9/28/09	Fri 10/2/09	5 days														
32	Unpack and Checkout	Mon 10/5/09	Fri 10/9/09	5 days														
33	Hand-off L1	Fri 10/9/09	Fri 10/9/09	0 days														
34	<b>Level 2 Build, Test and Delviery</b>	Fri 10/9/09	Fri 1/29/10	73 days														
35	Science Team Hand-off L2	Fri 10/9/09	Fri 10/9/09	0 days														
36	Build L2 first time	Mon 10/12/09	Mon 10/12/09	1 day														
37	Iterative step-through L2 PGE	Tue 10/13/09	Fri 11/6/09	19 days														
38	Candidate L2 Build	Mon 11/9/09	Mon 11/9/09	1 day														
39	<b>PGE Testing</b>	Tue 11/10/09	Fri 1/29/10	52 days														
40	Generate L2 Products	Tue 11/10/09	Fri 1/8/10	38 days														
41	Match-Up and Cal Subset	Wed 12/9/09	Fri 1/15/10	24 days														
42	JPL Testing	Tue 11/10/09	Fri 1/29/10	52 days														
43	Science Team Check-out	Tue 11/24/09	Fri 1/29/10	42 days														

