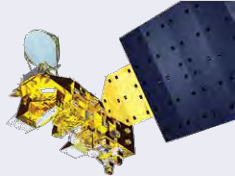

AIRS Project Status

Tom Pagano
AIRS Project Manager
Caltech NASA JPL
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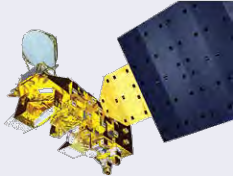
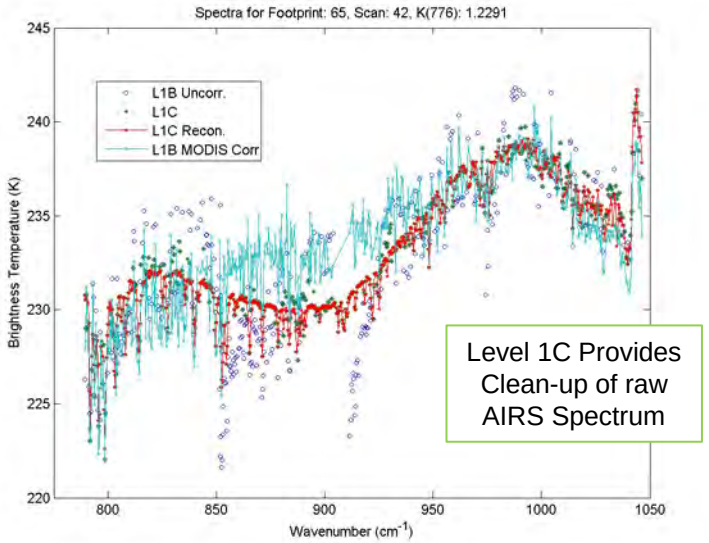
October 13, 2015

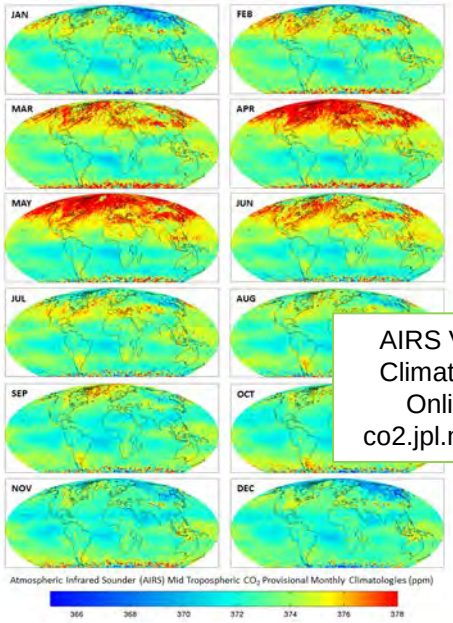
AIRS Project Elements Status



- Instrument Operations and Calibration
  - In-Flight calibration sequences for stability trending continue. AIRS maintains stable radiometric calibration.
  - L1C data product and documentation released to the public. Product improvements for V7 underway →
  - Comparing AIRS radiances to CrIS radiances
- Retrieval Testing and Simulation
  - Testing science team V7 algorithms and data products
  - Forward model testing and intercomparisons underway
  - WRF and LES model sampled and used as reference data sets
- Validation
  - AIRS Near Surface Air Temperature (NSAT) and Water Vapor compared with in-situ including surface stations over US and ship based radiosondes.
- Product Development
  - Released AIRS V5 CO_2 Climatology at co2.jpl.nasa.gov →
  - Version 6 CO_2 now a PGE. Updating QC Filtering.
  - Developed V7 Climatology Product Draft ATBD
- Applications
  - Infrastructure to support AIRS imagery in GIBS demonstrated
  - New products under test including drought indicators and vector borne disease Indicators
- Software and Data Processing
  - Upgraded processors and archive for faster processing at JPL, and improved compatibility with the JPL SIPS
  - New File Formats for V7



Level 1C Provides Clean-up of raw AIRS Spectrum



AIRS V5 CO_2 Climatologies Online at co2.jpl.nasa.gov

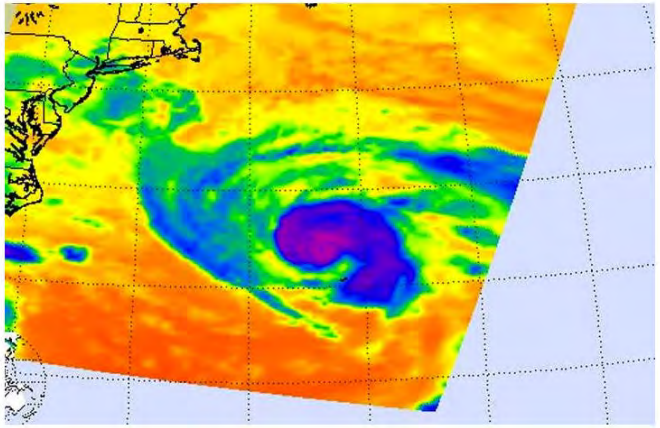
Jet Propulsion Laboratory
California Institute of Technology

AIRS Imagery Valuable in Conveying Weather, Climate and Processes

AIRS Hurricane Imagery Provides NRT Updates

http://phys.org/news/2015-10-aqua-terra-satellites-hurricane-joaquin.html

On the forecast track, the center of Joaquin will continue to move away from Bermuda.

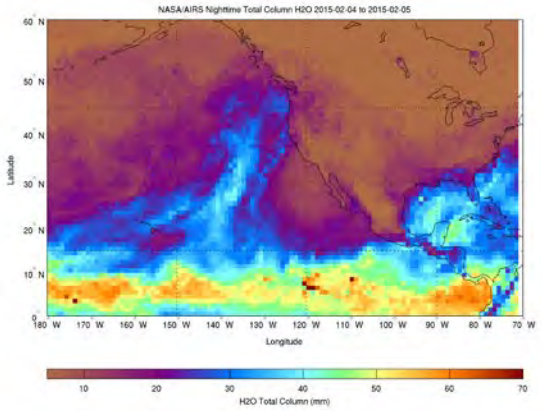


This false-colored infrared image from the AIRS instrument aboard NASA's Aqua satellite shows the powerful (purple), heavy rainmaking storms with cold cloud tops within Hurricane Joaquin on Oct. 5 at 6:29 UTC. Credit: NASA AIRS, Ed Olsen

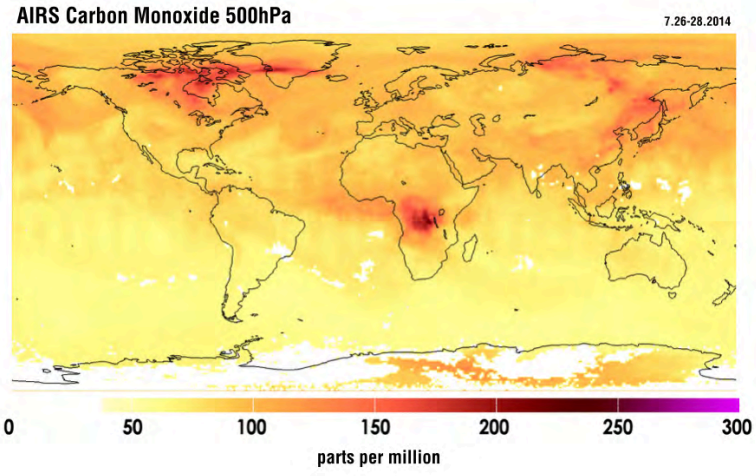
White house uses AIRS CO_2 imagery in video to promote America's Clean Power Plan

https://www.facebook.com/WhiteHouse/videos/10153662873839238/

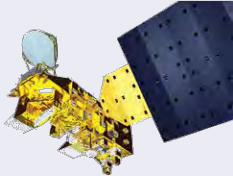
AIRS Sees Atmospheric Rivers and Drought Indicators

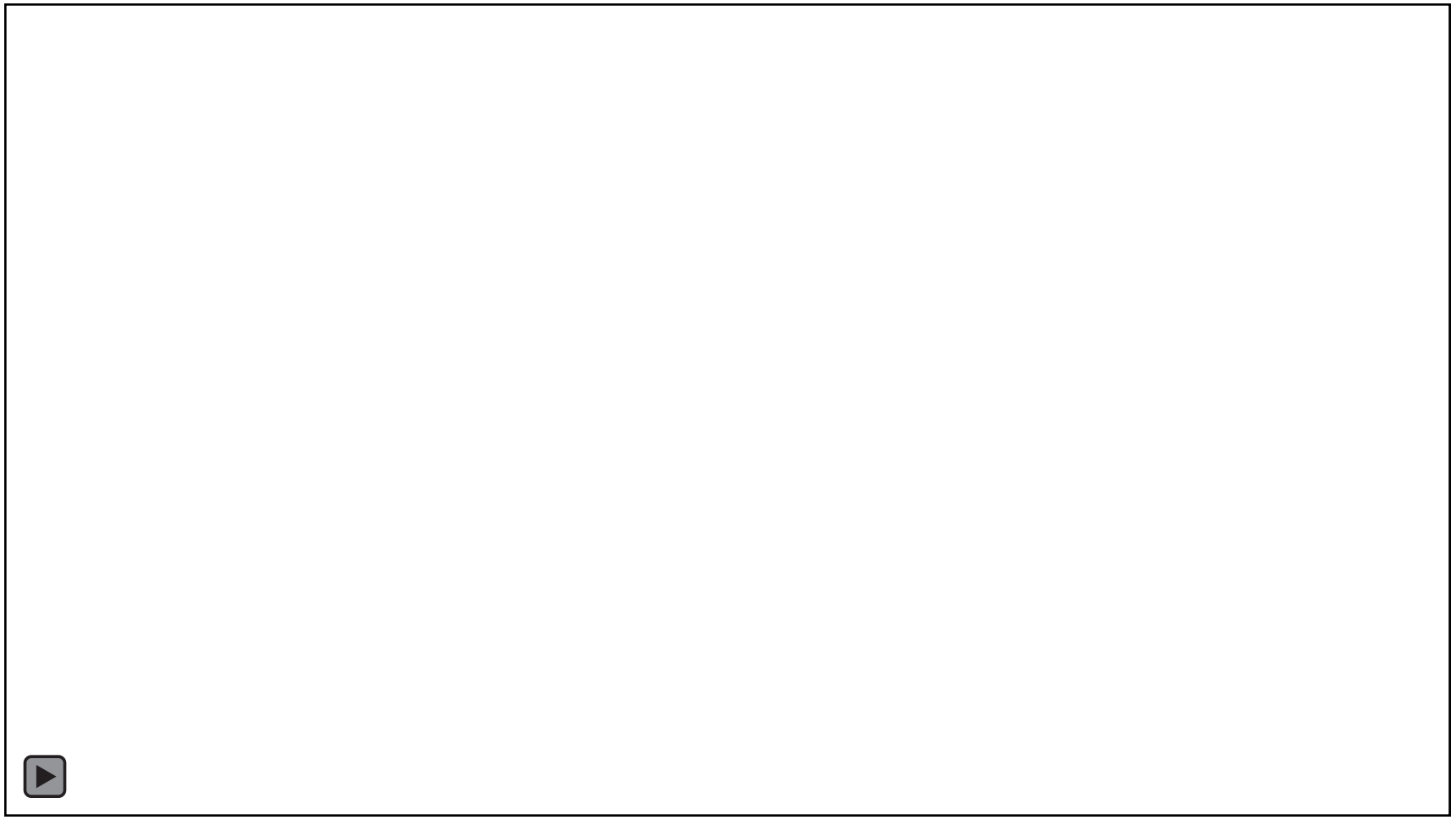


AIRS NRT Standard Products Imagery Nearly Ready for GIBS



AIRS animations highlight features of the data not previously expected





AIRS O3_VMR, 2014. Isosurface at 5 x 10^{-7} ppmv. Altitude Scale: 100, Altitude Offset: 10 km, Max Altitude (above which transparent): 18 km

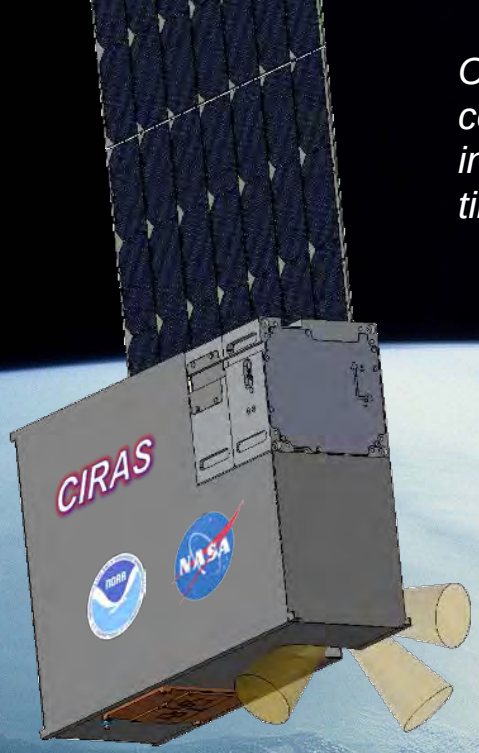
CubeSat Infrared Atmospheric Sounder (CIRAS)

For NASA InVEST

PI: Tom Pagano (JPL)

Sponsor: NASA ESTO

CIRAS will significantly reduce the cost of atmospheric sounding in the infrared and enable improved timeliness through constellations



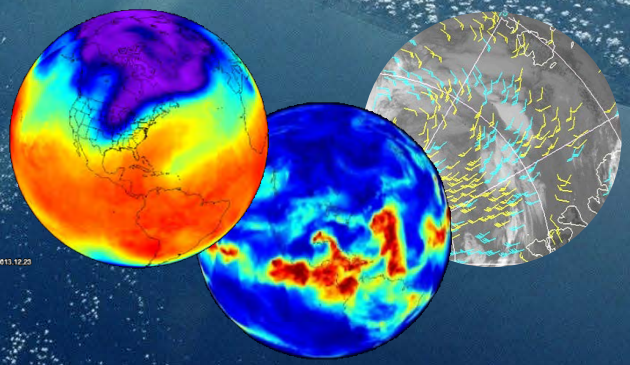
CIRAS Mission

- *Demonstrate Key Technologies needed for Infrared Instruments on CubeSats*
- *Demonstrate High Accuracy Temperature and Water Vapor Profile Mid-IR Radiance Measurements from a CubeSat Platform*
- *Fill Coverage Gaps and Improve Timeliness of Operational IR Sounders*

Parameter	CIRAS
Spatial	
Orbit Altitude	600-850 km
Scan Range	±22°
Horizontal Res'n	3.0 km
Spectral	
Method	Grating
Band 1	4.78-5.43 µm (TBR)
Res'n / Sampling	1.0 / 0.5 cm^{-1} (TBR)
Total Channels	500
Radiometric	
NEdT (@250K)	0.3 K
Resources	
Size	6U Cubesat
Mass	8.5
Power	37.5
Data Rate	2 Mbps

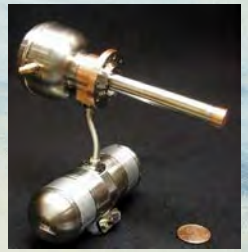
CIRAS Measurements

- *Lower Tropospheric Temperature Profiles*
- *Lower Tropospheric Water Vapor Profiles*
- *Experimental Demonstration of 3D Winds*



CIRAS Technologies

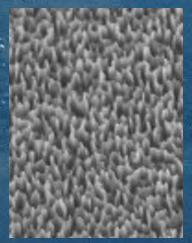
Micro Pulse Tube Cryocooler (Lockheed Martin)



Blue Canyon Technologies Spacecraft

JPL GRISM Spectrometer

JPL Black Si. Blackbody



JPL HOT-BIRD Detector