



IMAPP - International MODIS and AIRS Processing Package

Cooperative Institute for Meteorological Satellite Studies (CIMSS)

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1. Date, version and main features of IMAPP MODIS releases

Release	Date	Version	Main Features
1	5-12-00	MODIS L1 V1.0	LI to L1 Terra Geolocation & Calibration
2	11-1-00	MODIS L1 V1.1	Calibration and geolocation updates to version 2.4 Bug Fixes Support deflators operational and attitude data Support Schedules 0.8
3	4-13-01	MODIS L1 V1.2	Calibration algorithm and lookup tables update to version 3.0 and 3.0.1 Geolocation is updated using platform ephemeris and attitude. Terra conversion file geolocation provided.
4	12-31-01	MODIS L1 V1.3	Calibration algorithm and lookup tables update to version 3.0.0 and 3.0.0.7 Geolocation algorithm is updated.
5	5-1-02	MODIS L2 V1.1	First version product release for Terra MODIS Aqua MODIS calibration algorithm and lookup tables use version 3.0.1 and 3.1.0.2 Aqua MODIS geolocation requires ephemeris and attitude data IMAPP L1 processing steps handle both Terra & Aqua
6	9-13-02	MODIS L1 V1.4	Second MODIS product release Atmospheric scattering properties equivalent to DAAC MOD07 V1.0 First MODIS Terra/Aqua composite cloud mask and cloud top property release Band 26 resolution correction Cloud mask update to DAAC MOD05 V4.0 Cloud top property and phase updated to DAAC MOD06 V4.0.4 Terra Ingestor CF Terra/Aqua Extended Update to Terra/Aqua atmospheric sounding profile retrieval algorithm to DAAC MOD07 V4.0.0 Aqua Band 26 resolution correction coefficients
7	10-1-02	MODIS L2 V1.2	
8	2-19-03	MODIS L2 V1.3	
9	9-22-03	MODIS L2 V1.4	

The evolution of international polar orbiting weather satellite processing packages at CIMSS.

	ITPP	IAPP	IMAPP
Sensor / Data Type	HIRS/2 MSU AVHRR	HIRS/2 AMSU AVHRR	MODIS AIRS AMSU AMSR-E
Example Products	T/Q Sounding Cloud Height SST	T/Q Sounding Cloud Height SST	T/Q Sounding Cloud Phase Cloud Height SST Others
S/C	TiROS-N to NOAA 14	NOAA 15-17	EOS Terra & Aqua
Operation Period	1983 - Current	1998 - Current	2001 - Current

All IMAPP released software has been ported and tested on the following UNIX/PC platforms:
 •SGI MIPS, IRIX 6.5
 •Sun Ultra, Sun OS 5.7
 •IBM RS/6000, AIX 4.3
 •HP PA-RISC, HP-UX B.10.20
 •Intel Pentium, Red Hat Linux 7.2 (2.4-10.7) (with gcc/g77 2.96)
 •Intel Pentium, Solaris x86 5.8 (with gcc/g77 2.95.2)

<http://cimss.ssec.wisc.edu/~gumley/IMAPP/>

2. IMAPP Software

SSEC is funded by NASA to develop the International MODIS/AIRS Processing Package (IMAPP). The goals of the IMAPP project include:

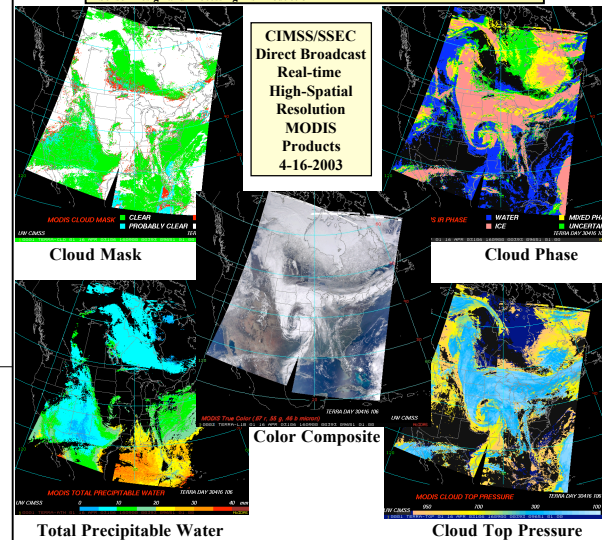
- To release a freely available package for processing MODIS and AIRS/AMSU/HSB data,
- To promote and support the worldwide use of EOS data, and to involve the international community in EOS validation efforts.

For this purpose, SSEC has adapted the operational Level-0 to Level-1 MODIS and AIRS geolocation and calibration software developed by NASA. The IMAPP requirements are:

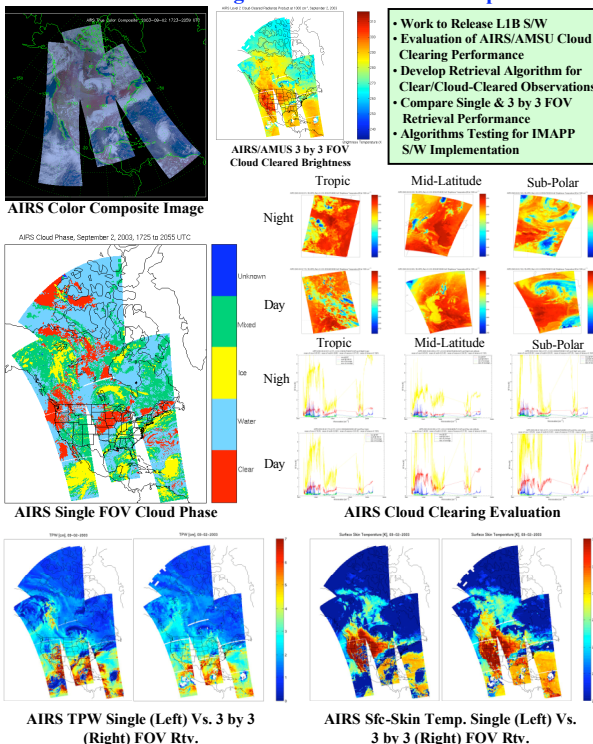
- IMAPP must be portable to a wide range of UNIX/PC platforms.
 - The number of required toolkits must be kept to a minimum.
 - Ancillary data sets must be easily accessible.
 - Software must be able to process overpasses of any size.
 - Downlinked spacecraft ephemeris and attitude data may be used for real-time geolocation.
 - Distributed products must be similar to those produced at the Goddard Space Flight Center (GSFC) Distributed Active Archive Center (DAAC).
 - The code must be efficient.
- IMAPP may be downloaded at no cost, and is licensed under the terms of the GNU General Public License (GPL). Science algorithms currently under development for release as part of IMAPP include:
 • MODIS SST; Land Surface Reflectance; Snow/Ice Detection; Aerosols, Cloud Optical Properties
 • AIRS/AMSU/HSB Level 0 to Level 1B; AIRS Temperature and Moisture Profiles
 • MODIS/AIRS Synergistic Cloud Clearing

3. MODIS Algorithms/Products Development

- Continue to update/support MODIS Terra/Aqua L1 & L2 S/W
- Continue to explore new products, algorithms and synergistic research
- Use MODIS Data, Algorithms and Products to Support NOAA's Geostationary Imager (ABI) Sensor Design and Processing Risk Reduction

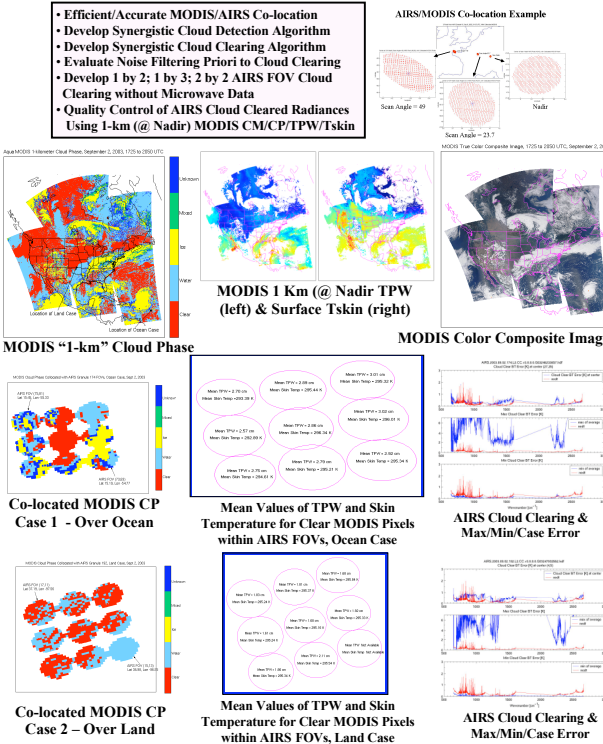


4. AIRS Data/Algorithm Evaluation/Development

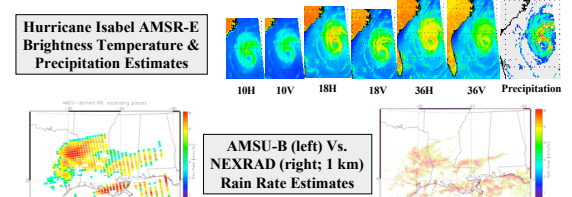


5. MODIS/AIRS Synergistic Cloud Detection/Clearing

- Efficient/Accurate MODIS/AIRS Co-location
- Develop Synergistic Cloud Detection Algorithm
- Develop Synergistic Cloud Clearing Algorithm
- Evaluate Noise Filtering Prior to Cloud Clearing
- Develop 1 by 2; 1 by 3; 2 by 2 AIRS FOV Cloud Clearing without Microwave Data
- Quality Control of AIRS Cloud Cleared Radiances Using 1-km (@ Nadir) MODIS CM/CP/TPW/Tskin



6. Under Development / Experimental Products



7. Summary and Future Work

	MODIS	AIRS/AMSU
Current	Geo-location/Navigation Cloud mask Cloud Phase Cloud top Property Clear T/Q Sounding Total Precipitable Water	Geo-location/Navigation (September, 2003; Beta Version released) Clear T/Q Sounding Total Precipitable Water
Planned	Cloud Particle Size Cloud Optical Thickness Aerosol Optical Thickness Surface Reflectance Sea Surface Temperature Snow Detection Sea Ice Detection Sea Ice Classification (Clouds and Land Surface)	Clear Cloudy T/Q Sounding Cloud Detection Cloud Clearing Cloud Height/Emissivity Surface Skin Temperature Cloud Liquid Water AMSU Precipitation estimate

Summary of current and upcoming IMAPP MODIS and AIRS product algorithms

- Support IMAPP Global Users
- Support Regional Near Real-Time Applications
- Improve/Expand Algorithms
- Release Updated/New S/W
- Conduct Algorithm/Product Developments
- Conduct Products Validation
- Provide Training, Research, & Visiting Scientist Opportunity
- Preparation for NPP/NPOESS Direct Broadcast Data Processing