Multi-Sensor Data From A-Train Instruments Brought Together for Atmospheric Research

The A-Train is comprised of a series of instruments, developed independently, that measure highly related atmospheric components along the same flight path. In order to intercompare data from this multitude of sensors, researchers must access, subset, visualize, analyze and correlate distributed atmosphere measurements from the various A-Train instruments. The A-Train Data Depot (ATDD) has been operational for over a year, successfully performing the aforementioned functions on behalf of researchers, thus providing co-registered data from the Cloudsat, CALIOP, AIRS, and MODIS instruments for further intercomparisons. Of late, significant data from OMI and POLDER are now included in the ‘depot’. By specifying the desired spatial and temporal range, the researcher can subset, visualize, co-register, and access multi-sensor A-Train data related to: Cloud, aerosol, atmospheric temperature, and water vapor parameters (vertical profile visualizations); Cloud Pressure, cloud top temperature, water vapor, cloud optical thickness, and aerosol products (horizontal strips subsetted +/- 100km from the profile visualizations); and; Cloud pressure parameters (2-D line plots overlayed on the vertical profiles). All data is plotted using the GIOVANNI data exploration tool. A new feature of GIOVANNI is its ability to have collocated and subsetted data sets as well as PNG image files downloaded to the researcher’s computing facility. By providing a convenient way to visualize and acquire multi-sensor data, ATDD affords users more time and effort to further their research.

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Abstract
The A-Train is comprised of a series of instruments, developed independently, that measure highly related atmospheric components along the same flight path. In order to intercompare data from this multitude of sensors, researchers must access, subset, visualize, analyze and correlate distributed atmospheric measurements from the various A-Train instruments.

Sensors: Cloudsat, CALIOP, AIRS, OMI, MLS, and MODIS
Areas of Study: Cloud, aerosol, atmospheric temperature, and water vapor parameters, atmospheric composition.
Services: Dynamically subset, visualize, co-register, and access multi-sensor A-Train data.
Saves researchers great amounts of time by using ATDD services.

What can the A-Train Data Depot Do For You
The A-Train Data Depot (ATDD) has been operational for more than a year:
- Provides access to A-Train datasets from one portal
- Provides user-friendly, data visualization, and exploration for science discovery.
- Performs most of the work each individual researcher would need to do to use this data.
- Creates user-specified subsets of just the information that are on the A-Train path.
- Thus, no need to download and store large volumes of data.
- Accesses remote heterogeneous datasets for convenient downloading.
- Co-registers datasets of different formats, resolutions, and onto common grids.
- Dynamically performs functions on specific user-requested data of interest.
- Provides a virtual data postprocessor that processes, archives, provides access, visualizes, analyzes and correlates distributed atmospheric measurements from various A-Train instruments along A-Train tracks.

LATEST NEWS:
Astra to move closer to other A-Train platforms: Better Science MLS will coincide with CloudSat and CALIPSO, globally, not just at the poles. (See http://science.nasa.gov/astro/astra/index.html for full story and science benefits).

Currently Accessible Products
Vertical Profiles (Curves Plot)
- CALIOP - Cloud/Aerosol Classification
- CloudSat - Liquid Water Path
- CloudSat - Reflectivity 3D
- CloudSat - RO Ice Water Content (new)
- CloudSat - RO Liquid Water Path (new)
- CloudSat - RO Liquid Water Content (new)
- CloudSat - RO Liquid Water Path (new)
- MODIS - Atmospheric Temperature Profile
- AIRS - Atmospheric Temperature Profile

Water Vapor Products
- MODIS - H2O Saturation Mass Mixing Ratio
- AIRS - H2O Vapors Mass Mixing Ratio

HORIZONAL STRIPS (150 km from CloudSat path) on line plot overlays upon vertical profile
- OMI - Effective Cloud Pressure for OI (RI)
- OMI - Effective Cloud Pressure (O2-O2)
- OMI - Total Aerosol Extinction Optical Depth (new)
- OMI - UW Aerosol Index (new)
- MODIS - Aerosol Optical Depth 554nm
- MODIS - Aerosol Fine Mode Fraction 554nm
- MODIS - Cloud Optical Thickness
- MODIS - Cloud Top Pressure
- MODIS - Cloud Top Temperature
- AIRS - Total Cloud Liquid Water

PROTOTYPE: POLDER data in the ATDD
You select, You visualize, You download.

PROTOTYPE: Exploring A-Train Data in 3D
You select, You visualize, You download.
MODIS Cloud Top Temperature for CloudSat Reflectivity profile.
CloudSat Reflectivity profile on MODIS Daily Cloud Top Temperature Vertical profile.

The A-Train Instrument Principal Investigators

2007 Metrics and Data
- Number of Products Provided: 4,917,916
- Number of Product Types Available: 38
- Volume of Data Distributed: 807 GB
- Volume of Data Available: 16 TB

Upcoming...
- POLDER data operational
- AMSR-E, TES, HIRDLS data
- NOZ, CO2, other products
- User Selected Ranges
- MLS data along the CloudSat track
- UV aerosol index background on the orbit picker