

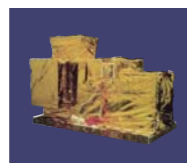
ASTER Project

The ASTER project is a Japan-U.S. joint earth observation program. ASTER (Advanced Spaceborne Thermal Emission and Reflection radiometer) is a high-performance optical sensor, and its target applications include resource exploration and environmental monitoring of the earth.

ASTER, on board of NASA's "Terra" satellite, was launched on December 19, 1999, and has been successfully in operation substantially exceeding its original mission life.



VNIR



SWIR



TIR



Tracking and Data Relay Satellite

Terra Orbit Parameters

- Orbit : Sun-synchronous
- Altitude : 705 km (on the equator)
- Local Sun Time: 10:30AM
- Orbit inclination: 98.2 deg.
- Orbital period: 98.88 minutes
- Repeat Cycle : 16 days
- Inter-orbit distance : 172 km

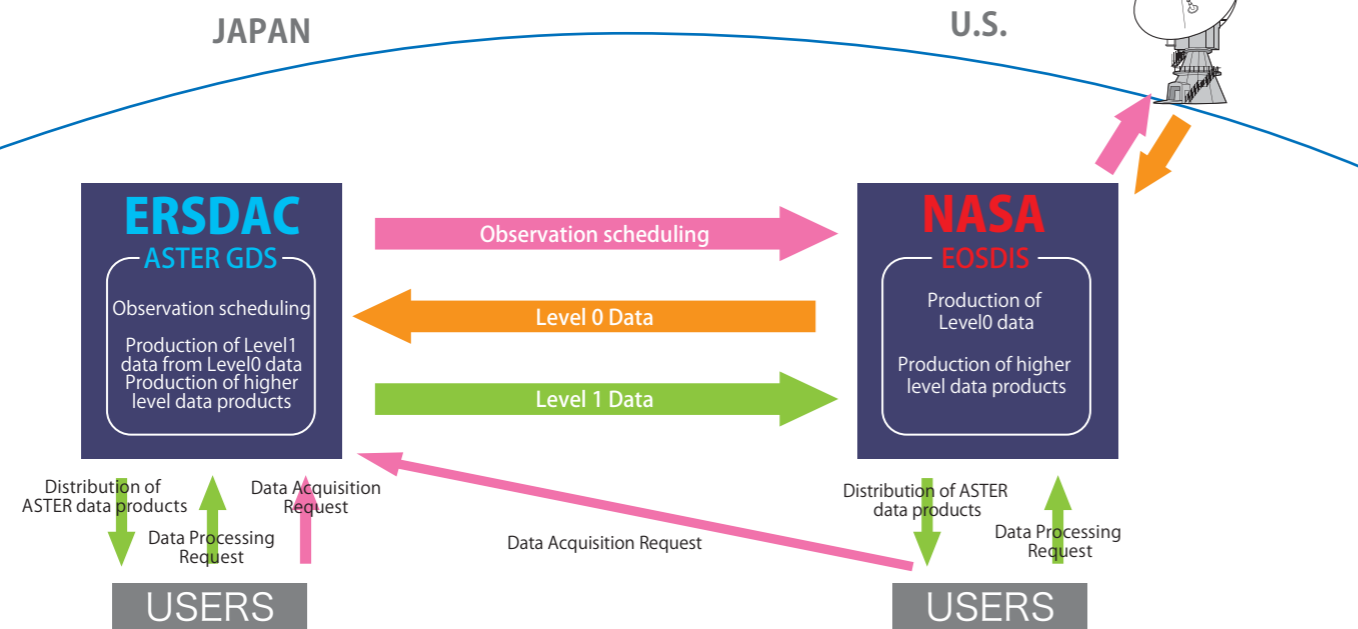
ASTER Features

- Multiband data observation from the visible to the thermal infrared wavelengths
- Three spectral-band radiometers and their spatial resolutions
 - : Visible and Near-Infrared Radiometer (VNIR) 15m
 - : Short Wave Infrared Radiometer (SWIR) 30m
 - : Thermal Infrared Radiometer (TIR) 90m
- Wide observation swath (60m)
- Stereoscopic viewing: nadir + backward looking
- (The base-to-height ratio 0.6 enables high accuracy DEM data.)
- Pointing capability of flexible observation

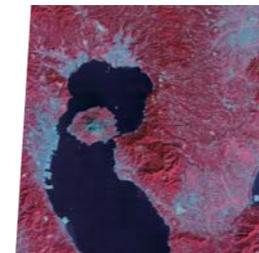
Japan-U.S. Collaboration

U. S. and Japan extensively collaborate in observations and ASTER data processing. NASA's primary responsibility is to fly the satellite and download the ASTER data to the ground station, while ERSDAC schedules the observations and produces Level 1A data. In addition to day-to-day operations of ASTER, two countries jointly promote the ASTER values and develop applications for ASTER data.

Tracking and Data Relay Satellite Ground System

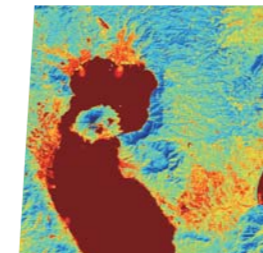


ERSDAC distributes ASTER data products to users in a wide range of scientific fields and commercial industries. The followings are the principal ASTER products.



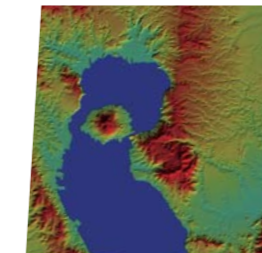
Level 1B

The observation data are geometrically and radiometrically corrected in the Level 1B data. The image in this page was created by combining data from three VNIR bands. The Level 1B product generally contains the data from all 14 bands ranging from VNIR to TIR as well as backward looking data. Being the most used standard data set, the Level 1B data products have a wide range of applications, such as resource exploration, land-cover classification, and environment monitoring.



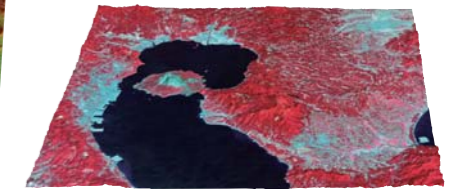
Level 2B03

This product is generated from the ASTER TIR data (Level 2B01T), and the ground surface temperature is derived from it. The Level 2B03 data products are being used in an urban heat island assessment trial.



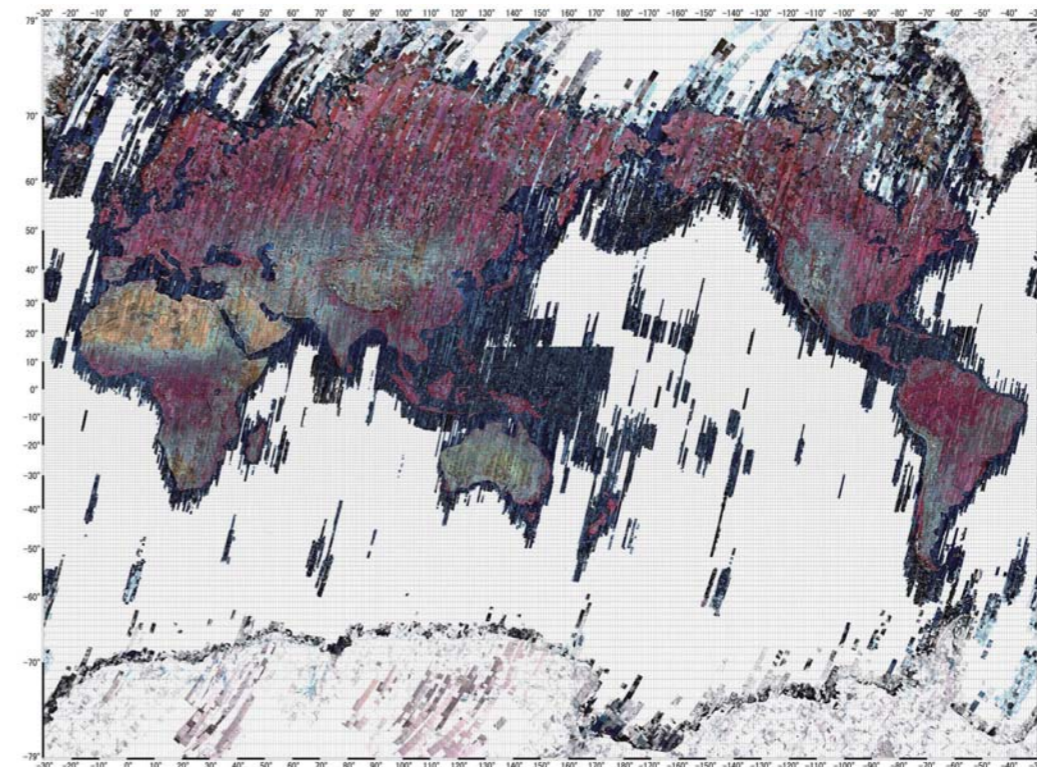
Level 4A01Z

This is the digital elevation model (DEM) generated from nadir-looking (band 3N) and backward-looking (band 3B) VNIR data where an algorithm developed by ERSDAC is applied. The image was created by "level slicing" in which the elevation contour is color coded.



Level 3A01

This product is an ortho-rectified image with the associated DEM data appended. The geometric distortion is corrected using the ASTER DEM data that was generated by the stereo pair. The Level 3A01 provides with the base data for GIS, bird's-eye viewing (shown above), and flight simulation systems.



ASTER had already acquired 1.6 million scenes of Earth's entire land area by February 2009. This global map was created by mosaicing images with few clouds.

For more information about ASTER data, please visit ASTER Ground Data System (ASTER GDS) web site. http://www.gds.aster.ersdac.or.jp/gds_www2002/index_e.html