PALSAR Project

The Phased Array-type L-band Synthetic Aperture Radar (PALSAR) is on the Advanced Land Observing Satellite (ALOS), as known as Daichi, and was launched in January 2006. The Ministry of Economy Trade and Industry (METI) of Japan and Japan Aerospace Exploration Agency (JAXA) jointly developed PALSAR. PALSAR can make observations of the earth regardless of the time of the day, or weather conditions. PALSAR' s contributions are in the fields of natural resources exploration, monitoring of environmental changes, and impact assessment of natural disasters..

ALOS Orbit Data

Orbit：Sun synchronous sub-recurrent
Altitude on the Equator：691.65 km
Local Sun Time：10:30 am ±15 min
Orbit Inclination：98.16°
Orbital Period ：98.7 minutes
Recurrent Cycle：46 days
Total Number of Paths：671 paths
Inter-orbit Distance on the Equator：59.7 km

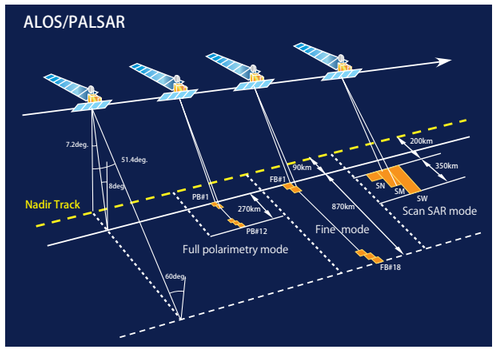
Features

- World's only one space-borne SAR system using L-band (1.27GHz, Wave Length 23.6cm)
- World's first full polarimetry observation capability
- World class ground resolution (max. 10 m)
- Steerable off-nadir angles (9.7 to 50.8°)
- Max. 350 km wide observation swath (ScanSAR)

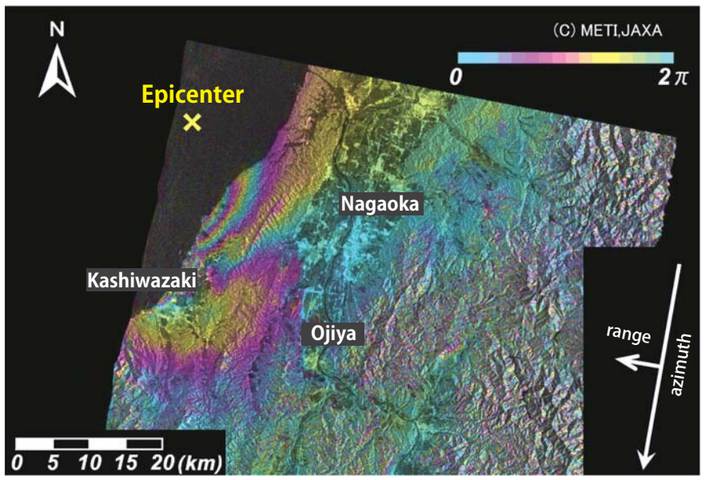
Observation Modes

	Ground Resolution (Typical Value)	Polarization	Swath
Fine Mode (Single, Dual)	10m (Single Polarization)	HH or VV	40km to 70km
	20m (Dual Polarization)	HH+HV or VV+VH	
Polarimetry Mode (Full Plolarimetry)	30m	HH+HV+VH+VV	20km to 65km
ScanSAR Mode (ScanSAR)	100m (Multi-look)	HH or VV	250km to 350km

Note: H: Horizontal Polarization, V: Vertical Polarization



An Example of Interferometry Image



This figure shows surface deformation as the result of an earthquake. A single color cycle from blue to red to yellow to green, means 11.8 cm of ground subsidence, whereas a single color cycle from green to yellow to red to blue, means 11.8 cm of ground uplift.

Interferometry Image after the Niigata Chuetsu-oki Earthquake in 2007

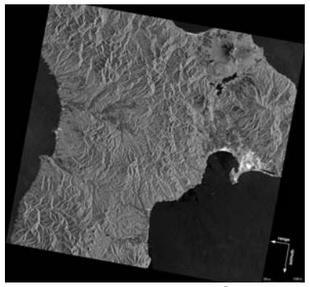
PALSAR data have many applications, including assessment of ground deformation and forest biomass. PALSAR GDS produces five types of products and users can purchase the data sets for their own purposes.

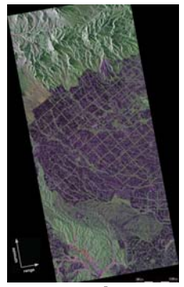
Level 1.0

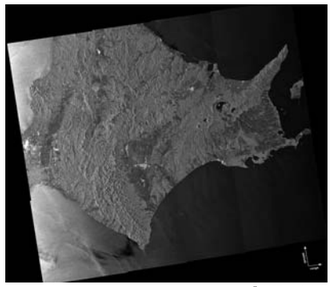
A Level 1.0 product is generated from the raw data (L0) to which the orbit information and bit re-alignment are applied.

Level 1.1

The Level 1.1 product is single-look complex data generated from the L1.0 product, to which the SAR processing is applied. In the L1.1 products the PALSAR data are evenly spaced on the slant range with the space equal to the measurement sampling interval. Interferometry analyses use the Level 1.1 products.







Level 1.5

The level 1.5 product is generated from single polarimetry fine-mode data, to which the multi-look SAR processing is applied. In the L1.5 product the PALSAR data are evenly spaced on the ground range. This is the most commonly used PALSAR product primarily for analyses of geological structures and surface features.

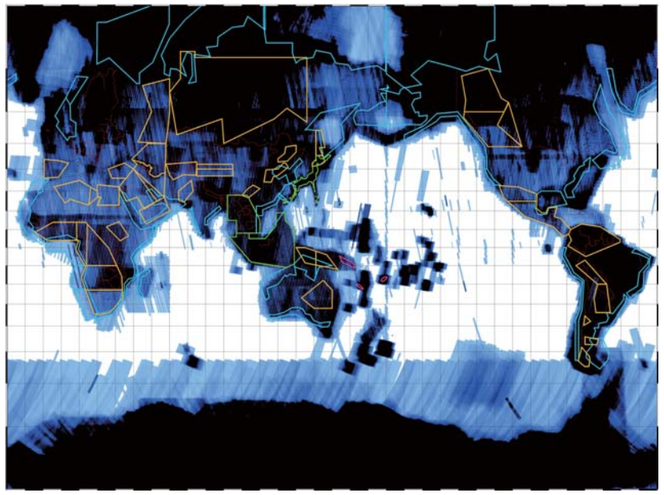
Level 4.1

The Level 4.1 product is generated from multi (2 or 4)-polarimetry data, to which the SAR processing is applied. Development of the L 4.1 product applications are targeted for lithology and forest classification.

Level 4.2

The Level 4.2 product is made from the "ScanSAR" mode data, to which the SAR processing is applied. The HH or VV single polarimetry is used in this observation mode. Its observation swath, 250 to 350 km, is so wide, the Level 4.2 data is most suitable for observation of very large targets such as drift ice or oil spills from tankers, despite its lower resolution..

PALSAR World Coverage



PALSAR has already acquired 1.33 million scenes as of February 2009. This figure shows all observed scenes overlayed on a single world map, and the different shade of blue shows the PALSAR observation frequency.

Legend

- L0 Data Regien
- Basin Mapping
- Coastal Region Basin Mapping
- Environmental Monitoring
- Application of SAR Polarimetry

Number of Observations

1 5 10 15 20 25 30 >31

For more information about PALSAR data, please visit the PALSAR GDS Project web site.
http://www.palsar.ersdac.or.jp/e