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Prepared by JAXA
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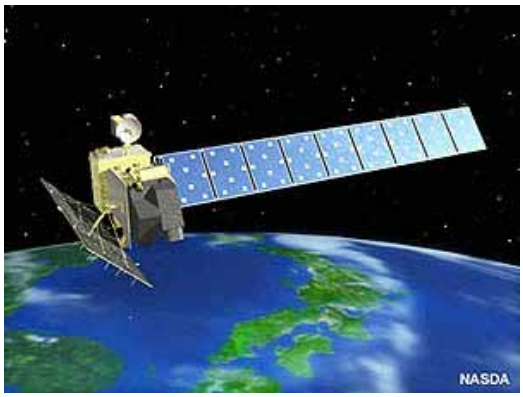
Status of Advanced Land Observing Satellite (ALOS)

This document reports on an overview and the status of JAXA's Advanced Land Observing Satellite (ALOS)

Status of Advanced Land Observing Satellite (ALOS)

1. Overview

The Advanced Land Observing Satellite (ALOS) has been developed to contribute to the fields of mapping, precise land coverage observation, disaster monitoring, and resource surveying. It enhances land observation technologies acquired through the development and operation of its predecessors, the Japanese Earth Resource Satellite-1 (JERS-1, or Fuyo) and the Advanced Earth Observing Satellite (ADEOS, or Midori).



ALOS is one of the world's largest earth observation satellites whose function is to collect global and high resolution land observation data. Because of the large increase of observation data it will be transmitted to EOC via both DRTS and as a direct downlink. In this way observation data can be rapidly acquired by EOC from all areas.

ALOS Spacecraft

Launch	December 2005 / H-IIA Tanegashima Space Center
Orbit	Sun-Synchronous Sub-Recurrent Repeat Cycle:46 days/Sub Cycle:2 days
Weight	about 4,000kg

ALOS's remote-sensing equipment enables precise land coverage observation and can collect enough data by itself for mapping on a scale of 25,000 to 1. It is expected to play an important role in cartography by providing maps of Japan and other countries, including those in the Asia-Pacific region, which is one of ALOS's main objectives. Other objectives include regional observation for harmonization between the environment and development on Earth, domestic and overseas disaster monitoring and resource surveys, and technological development for future Earth-observing projects. Its contributions to the mitigation of environmental destruction and natural disasters will make it an essential satellite for our future. It will be launched by an H-IIA launch vehicle from the Tanegashima Space Center. The launch date is currently scheduled in 2005 (Japanese Fiscal Year), but not earlier than December 2005.

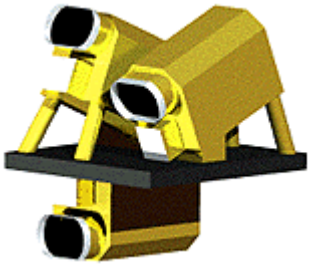
2. Observation Instruments

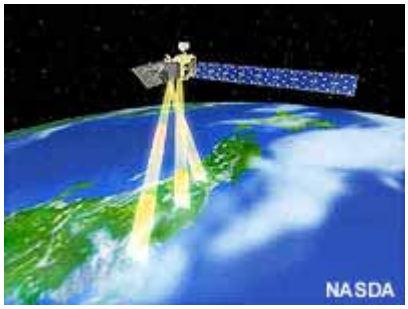
ALOS has three sensors: the Panchromatic Remote-sensing Instrument for Stereo Mapping (PRISM), which is comprised of three sets of optical systems to measure precise land elevation; the Advanced Visible and Near Infrared Radiometer type 2 (AVNIR-2), which observes what covers land surfaces; and the Phased Array type L-band Synthetic Aperture Radar (PALSAR), which enables day-and-night and all-weather

observation.

2.1 Panchromatic Remote-sensing Instrument for Stereo Mapping (PRISM)

PRISM is a panchromatic radiometer with 2.5-meter spatial resolution. In order to obtain terrain data including elevation, PRISM has three optical systems for forward, nadir and backward view. Precise land information can be obtained frequently by PRISM.

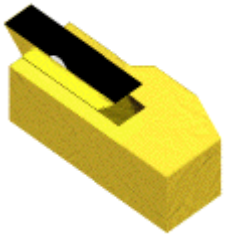


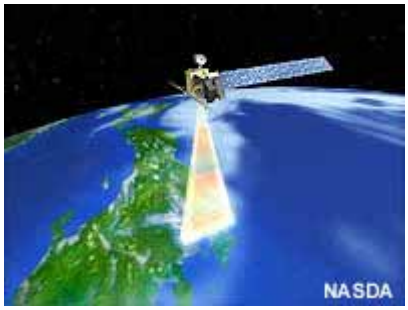


Observation band	0.52 - 0.77 μm
Number of Optics	3 (Nadir/Forward/Backward)
Base/Height ratio	1.0 (Forward/Backward)
S/N	>70
MTF	>0.2
Spatial Resolution	2.5m
Swath Width	35km(Triplet mode) 70km(Nadir Only, Wide swath mode)
Pointing Angle	+-1.5deg.(Triplet mode)

2.2 Advanced Visible and Near Infrared Radiometer type 2 (AVNIR-2)

AVNIR-2 is a visible and near-infrared radiometer for observing land and coastal zones and provides better spatial resolution than ADEOS's AVNIR. It will be used to provide land coverage maps and land-use classification maps for monitoring regional environment. The instrument has a cross track pointing capability for disaster monitoring.

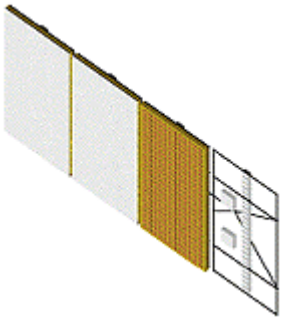


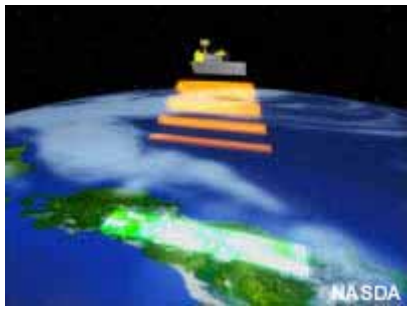


Observation Band(μm)	Band1 : 0.42 - 0.50 Band2 : 0.52 - 0.60 Band3 : 0.61 - 0.69 Band4 : 0.76 - 0.89
S/N	>200
MTF	>0.2
Spatial Resolution	10m(at Nadir)
Swath Width	70km(at Nadir)
Pointing Angle	About +-44deg.

2.3 Phased Array type L-band Synthetic Aperture Radar (PALSAR)

PALSAR is an active microwave sensor for cloud-free and day-and-night land observation and provides higher performance than JERS-1's SAR.This sensor has a beam steer able in elevation and the ScanSAR mode, which allows us to obtain a wider swath than conventional SARs. The development of PALSAR is a joint project between JAXA and the Japan Resources Observation System Organization (JAROS).
The antenna consists of 4 flat boards, 3.1m by 2.2m each, and they are folded at launch. The antenna will be deployed approximately 2 days after the launch of ALOS.





Observation mode	**Fine Resolution**	**ScanSAR**
Frequency	L-band(1.27GHz)	
Polarization	HH,VV,HH&HV,VV&VH	HH,VV
Spatial Resolution	10m	100m
Swath WIDTH	70km	250-350km
Off-nadir Angle	10-51deg.	
NE sigma^0	About -23dB	