ALOS and PALSAR

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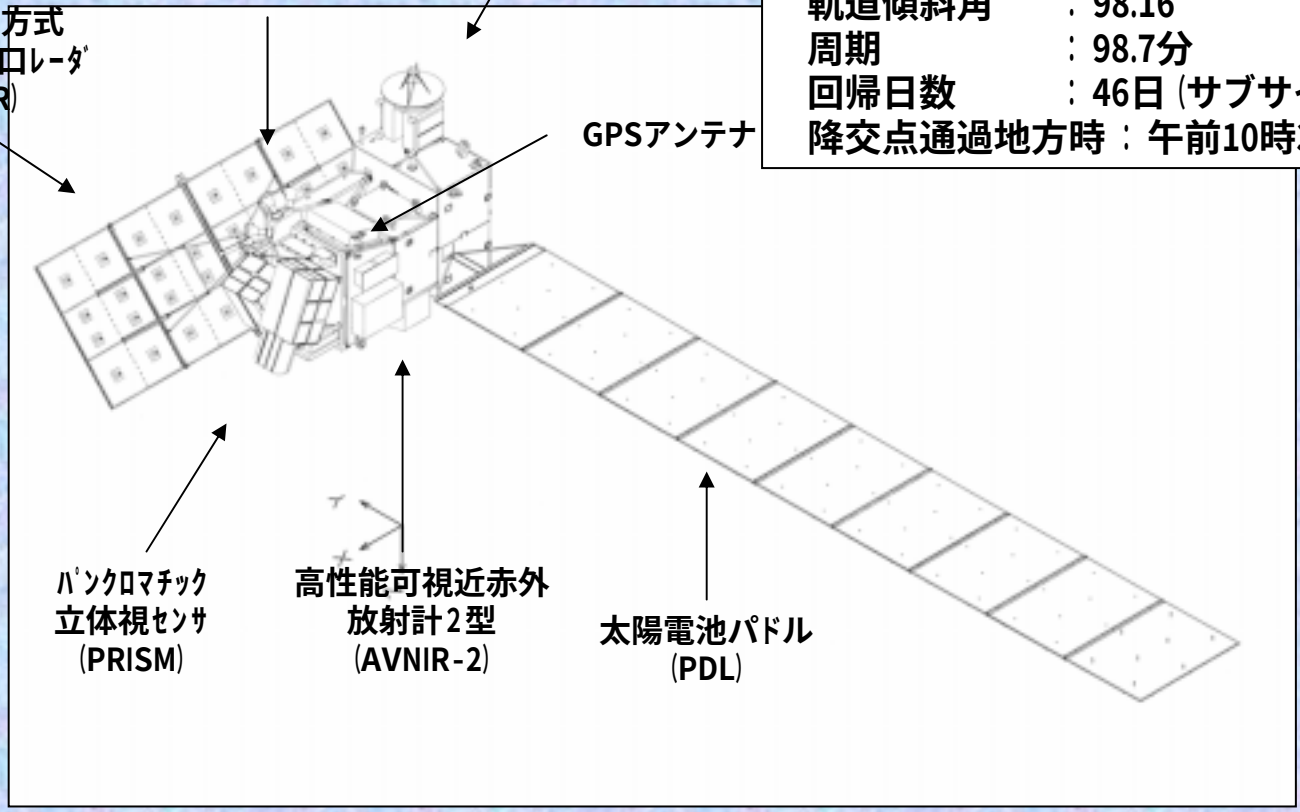
EORC NASDA 2003

ALOS performance, view on orbit

Main specification

打上げ時期	: JFY 16 (2004)
質量	: ~4,000kg
発生電力	: ~7kW
設計寿命	: 3年以上、5年目標
軌道	: 太陽同期準回帰軌道
高度	: 691.65km
軌道傾斜角	: 98.16°
周期	: 98.7分
回帰日数	: 46日 (サブサイクル2日)

降交点通過地方時 : 午前10時30分±15分



ALOS parameters

TABLE I Orbit of ALOS

Type	Sun-Synchronous Sub-recurrent
Local Time at DN	10:30 AM ± 15min.
Altitude	691.65km
Inclination	98.16 degrees
Revolutions per day	14+27/46
Period	98.7 minutes
Longitude Repeatability	+/-2.5km (above equator)
Max. operation period	70 minutes per orbit
Data collection	DRTS+direct transmission
Yaw steering	Selective ON/OFF
Attitude error each axis	0.4e-4 ° (determination), 0.1 ° (maintenance)

Project Schedule

Before launch CAL.	Initial mission check	Initial CAL.	CAL.

Data release(limited for PI , PDF for general)

Data release

L/VAL review
rch 20 2003

CAL/VAL review
DEC 2003

EOC software version

Ver.0

Ver.1

Ver.2

Ver.n

EORC software version

Ver.0

1 year after

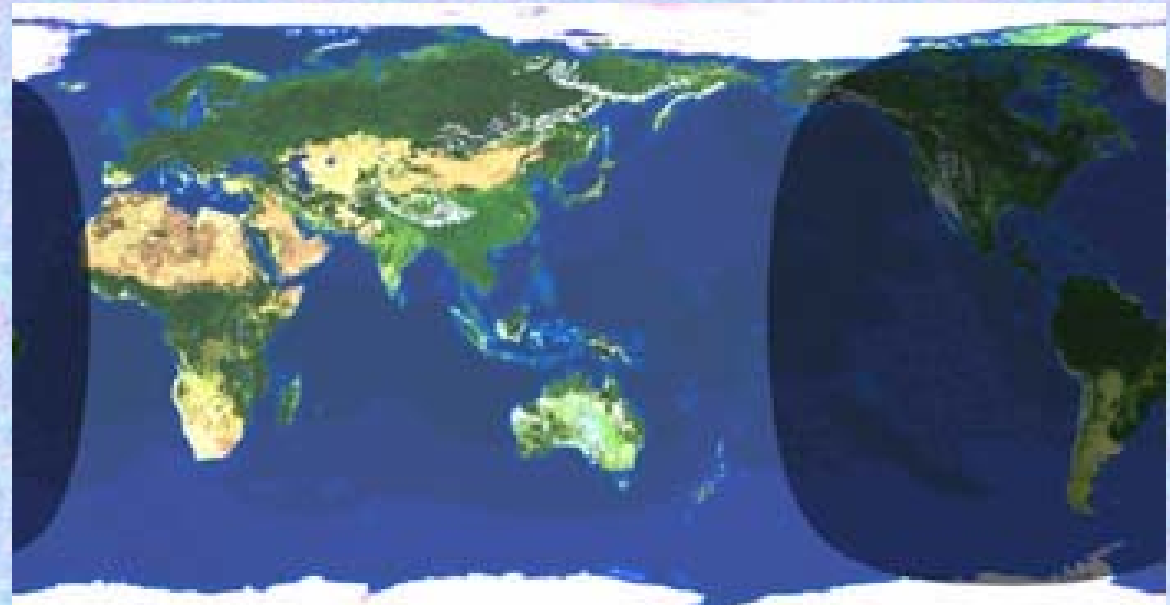
Ver.1

Ver.n

Launch Date: Later than Sept. 10, 2004

Data acquisitions - basic numbers (予測量)

Sensors	PALSAR	PRISM	AVNIR2
Averaged scenes to be collected during 46 days	42000	83000	42000
Number of land images(scenes)	85000	336000	85000



RTS coverage: DRTS is over the Indian ocean. When ALOS appears in the bright zone, the

PALSAR CHARACTERISTICS

Band width	28.0/14.0MHz
Pulse width	27.0/16.0μs(full pol mode)
Sampling frequency	32.0/16.0MHz
PRF	1500~2500 Hz
Observation side	Right hand side of the moving dir.
Trans. peak power	2 kW
No. of TR modules	80
No. of antenna beams	18+5 (Scan SAR)
STC	selective(0-7 dB in STC ON)
Data	I+Q with 5/3 bits
AGC/MGC	selective
MGC	0-44dB
STC	0-7dB
Center frequency	1270MHz(L-band)
Chirp	Down chirp (Digital)
Data rate	240/120Mbps
PRF changes per orbit	7 times in a half orbit
Period of AGC mon.	Every 32 pulses
polarizations	HH, VV, HH+HV, VV+VH, full pol.
Number of modes	132

PALSAR Modes

Mode	High Resolution		Direct Downlink	SCANSAR	Polarimery
	Single Polarization	Dual Polarization			
Frequency	L band (1270MHz)				
Chirp Bandwidth	28MHz	14MHz	14MHz	14/28MHz	14MHz
Polarization	HH or VV	HH/HV or VV/VH	HH or VV	HH or VV	HH/HV +VV/VH
Incidence Angle	8-60deg (typ 39deg)	8-60deg (typ 39deg)	8-60deg (typ 39deg)	18-43deg	8-30deg (typ 24deg)
Range Resolution	7-44m 10m@39deg	14-88m 20m@39deg	14-88m 20m@39deg	100m (Multi-look)	24-89m 30m@24deg
Swath Width	40-70km	40-70km	40-70km	250-350km	20-65km
Bit Length	5 bits	5 bits	3/5 bits	5 bits	3/5 bits
Data Rate	240Mbps	240Mbps	120Mbps	120/240Mbps	240Mbps

•Representative off-nadir angle (degrees):21, 34.3, 43.4

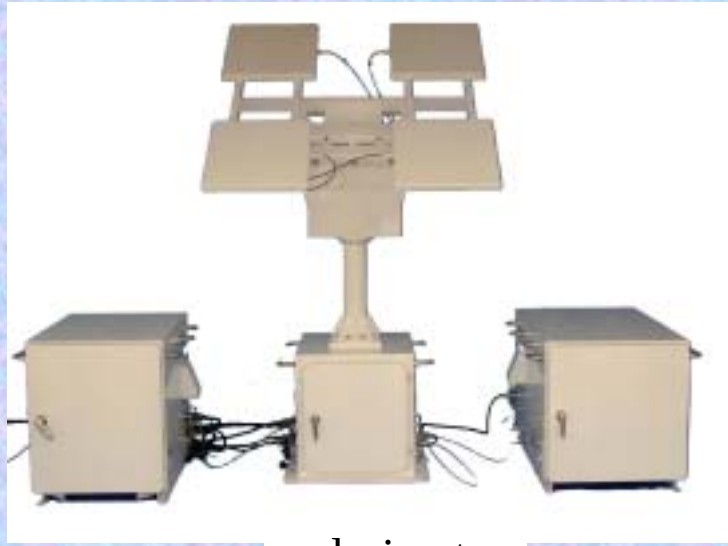
Status of ALOS and PALSAR

Satellite : now in Tsukuba Space Center. Well Conditioned.
Expected launch: Sept. 10 2003 or later
All the sensor Prelaunch data have been acquired. They are PALSAR , PRISM, and AVNIR2 data.
PALSAR : All the data are being analyzed and some of them are made as database. They are Antenna pattern, STC, AGC, etc.
PALSAR polarimetric mode was not correctly implemented, thus, it will be repaired to correctly work in a few months.
ALOS observation scenario is being developed. There defined representative operation mode:HH, HH+HV, SCANSAR, and Polarimetry.
Calibration plan of the PALSAR is being developed.
Calibration
Calibration instrument : Polarimetric Active radar calibrator(PARC) has been developed. It will be deployed at Tsukuba space center. It will be remotely controlled from EORC.
Calibration data acquisition is being planned especially for the initial calibration phase. Three off-nadir angles , 21, 34, 43 for HH, HH+HV; 5-SCAN short; and 21 of Polarimetry

EORC processing subsystem
Computer systems will be setup by the end of June 2003. Linux based Pentium system are the main body. 3.0 GHz 128 CPUs are the main body, and 40 TB hard disk will be used.

Polarimetric Active Radar Calibrator

Single POL.



polarimetry

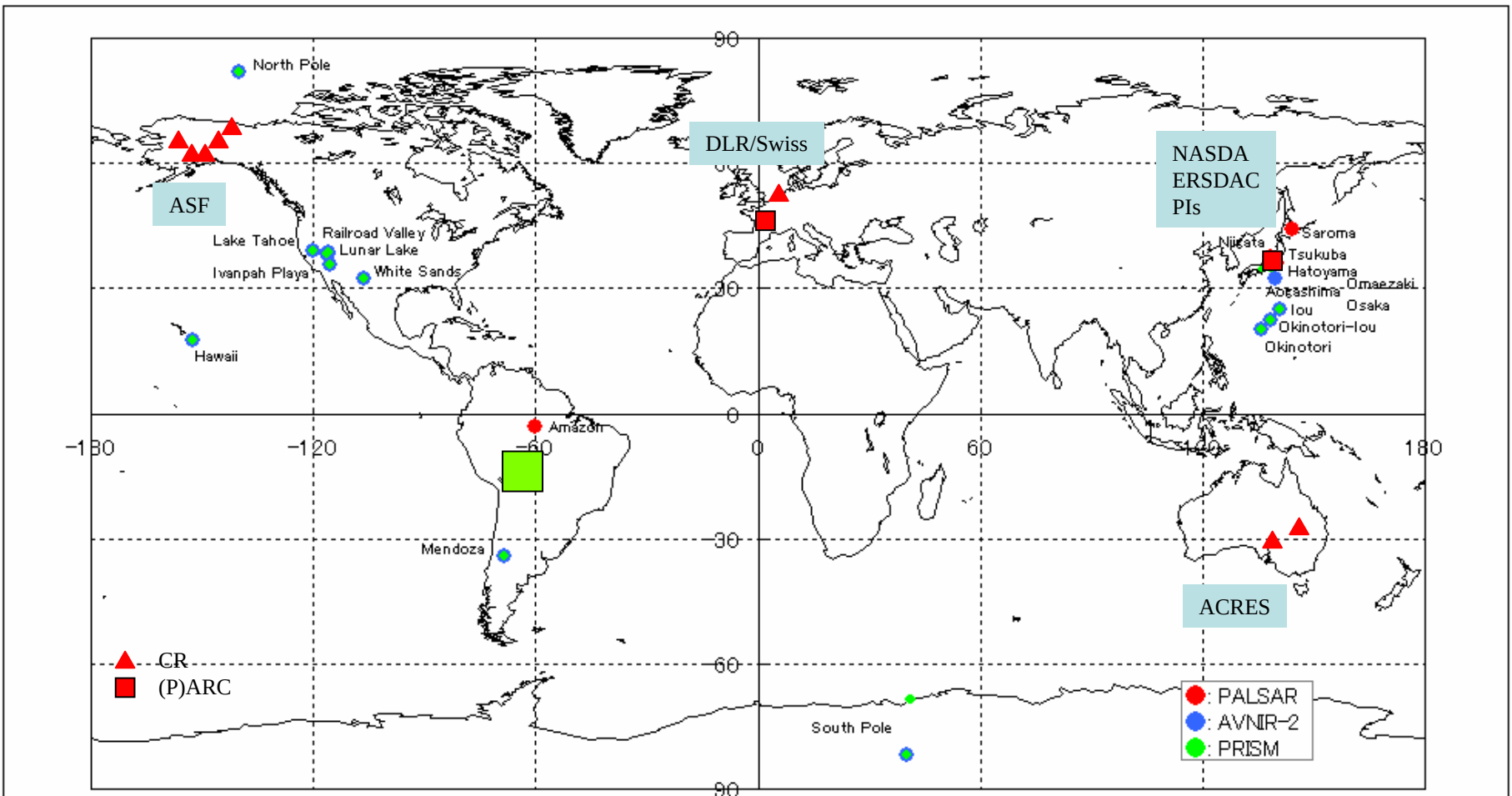
- Polarimetry and single polarization supported.
- Remotely controlled for off nadir angle.
- High RCS stability using thermally insulated units and ALOS tracking performance.
- Wide resistance for temperature and humidity
- PARC mode prepares the H and V phase difference

	ARC	PARC
Frequency band	1256～1284MHz	1256～1284MHz
Off nadir angle	9.9～50.8 °	9.9～50.8 °
RCS	15～60dBm^2	15～60dBm^2
RCS stability	<±0.1dB	<±0.1dB
ALOS tracking	Yes(program tracking)	Yes(program tracking)
Max. Rec. power	-44.5dBm	-44.5dBm
Max. trans. Power	22.5dBm	22.5dBm
temperature range	-10～+50°C	-10～+50°C
Humidity range	35～100%RH	35～100%RH

Calibration site

Calibration sites will be set in cooperation with related agencies.

機関	タイプ	個数	場所
NASDA	PARC	4	鳩山、筑波
	CR	2+2	苫小牧
ERSDAC	PARC	3	未定
	CR	2	未定
CNES/ESA	CR	10	ドイツ、スイス
	ARC	1	オランダ
AU-ADN	CR	2	未定
ASF/NOAA	CR	5	フェアバンクス
その他	ARC/CR	3+10	日本
NASDA	森林	1	アマゾン



EORC：Processing subsystem

Functions:level zero processing, level 1.5 path processing, high level processing