

JAXA LSI Support

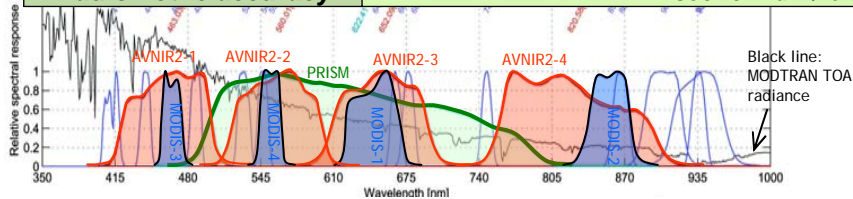
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***Earth Observation Research Center
Japan Aerospace Exploration Agency***

***28th WGCV meeting
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Sanya, China***

Synthetic Aperture Radar

PALSAR Characteristics				
Mode	Fine		ScanSAR	Polarimetric (Experimental mode)*1
Center Frequency	1270 MHz (L-band)			
Chirp Bandwidth	28MHz	14MHz	14MHz, 28MHz	14MHz
Polarization	HH or VV	HH+HV or VV+VH	HH or VV	HH+HV+VH+VV
Incident angle	8 ~ 60 deg.	8 ~ 60 deg.	18 ~ 43 deg.	8 ~ 30 deg.
Range Resolution	7 ~ 44m	14 ~ 88m	100m (multi look)	24 ~ 89m
Observation Swath	40 ~ 70 km	40 ~ 70 km	250 ~ 350km	20 ~ 65km
Bit Length	5 bits	5 bits	5 bits	3 or 5bits
Data rate	240Mbps	240Mbps	120Mbps, 240Mbps	240Mbps
NE sigma zero *2	< -23dB (Swath Width 70km) < -25dB (Swath Width 60km)		< -25dB	< -29dB
S/A *2, *3	> 16dB (Swath Width 70km) > 21dB (Swath Width 60km)		> 21dB	> 19dB
Radiometric accuracy	scene :1dB / orbit :1.5 dB			



Spectral response functions of AVNIR-2 (red), PRISM (green), and MODIS (blue)

Multi-band
visible and
near infrared
radiometer
Push-bloom
3550x2(e/o)det
ector/channel

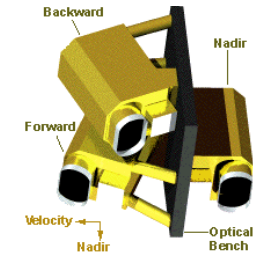
AVNIR-2 Characteristics	
Wavelength	Band1 : 0.42 - 0.50 μ m Band2 : 0.52 - 0.60 μ m Band3 : 0.61 - 0.69 μ m Band4 : 0.76 - 0.89 μ m
Spatial Resolution	10 m (at Nadir)
Swath Width	70 km (at Nadir)
S/N	>200 (at DN=255)
MTF	Band 1~3 : >0.25 Band 4 : >0.20
Number of Detectors	7100 / band
Pointing Angle	- 44 to + 44 deg.
Bit Length	8 bits

Note: PALSAR cannot observe the areas beyond 87.8 deg. north latitude and 75.9 deg. south latitude when the off-nadir angle is 41.5 deg.

*1 Due to power consumption, the operation time will be limited.

*2 Valid for off-nadir angle 34.3 deg. (Fine mode), 34.1 deg. (ScanSAR mode), 21.5 deg. (Polarimetric mode)

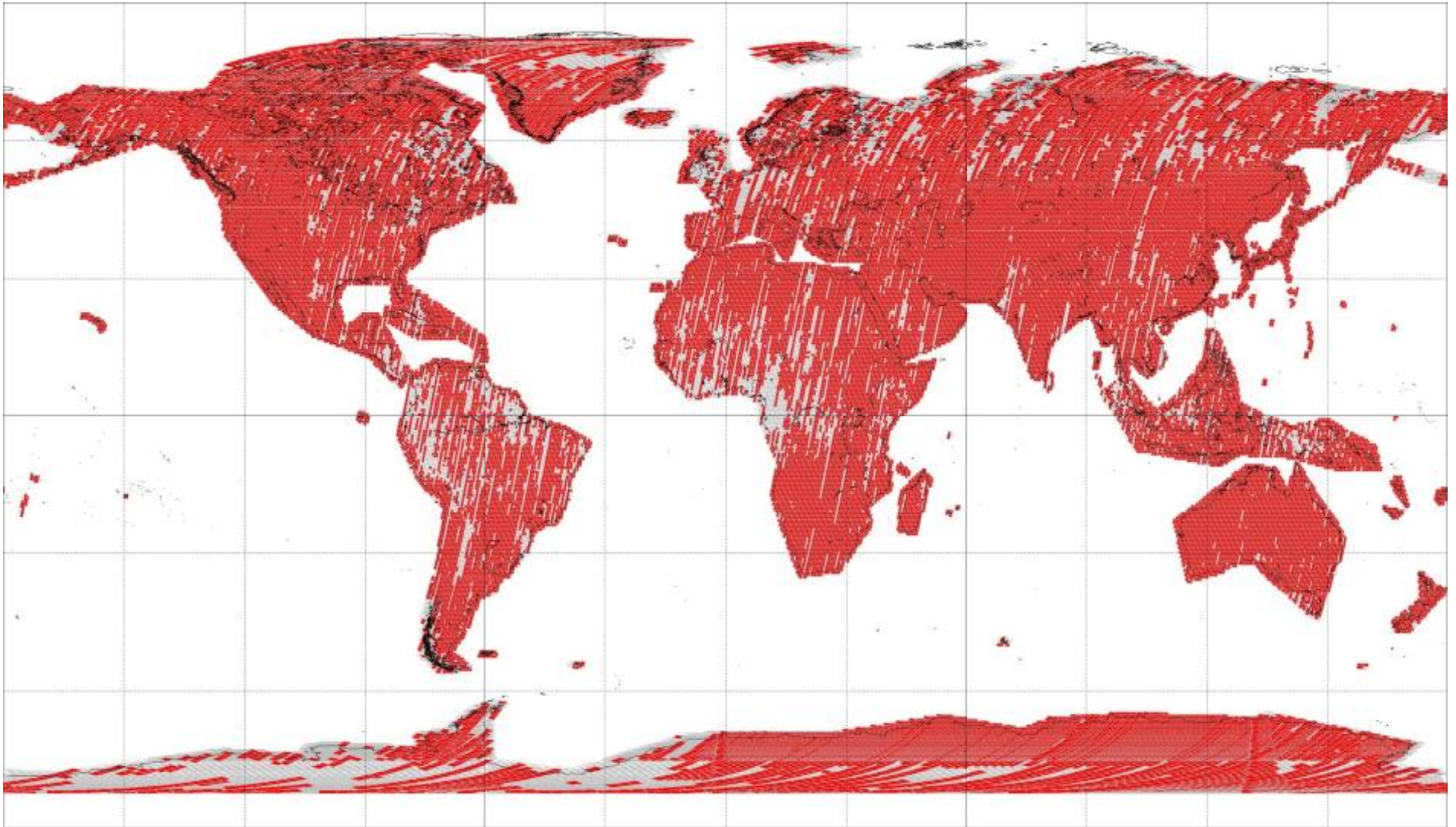
*3 S/A level may deteriorate due to engineering changes in PALSAR.



Panchromatic 3-direction radiometer

PRISM Characteristics	
Wavelength	0.52 ~ 0.77micrometers
Number of Optics	3 (Nadir; Forward; Backward +/-23.8deg)
Base-to-Height ratio	1.0 (between Forward and Backward looking)
Spatial Resolution	2.5m
Swath Width	70km (Nadir only) / 35km (Triplet mode)
S/N	>70
MTF	>0.2
Number of Detectors	28000 / band (Swath Width 70km) 14000 / band (Swath Width 35km)
Pointing Angle	-1.5 to +1.5 deg. (Triplet Mode, Cross Track)
Bit Length	8 bits

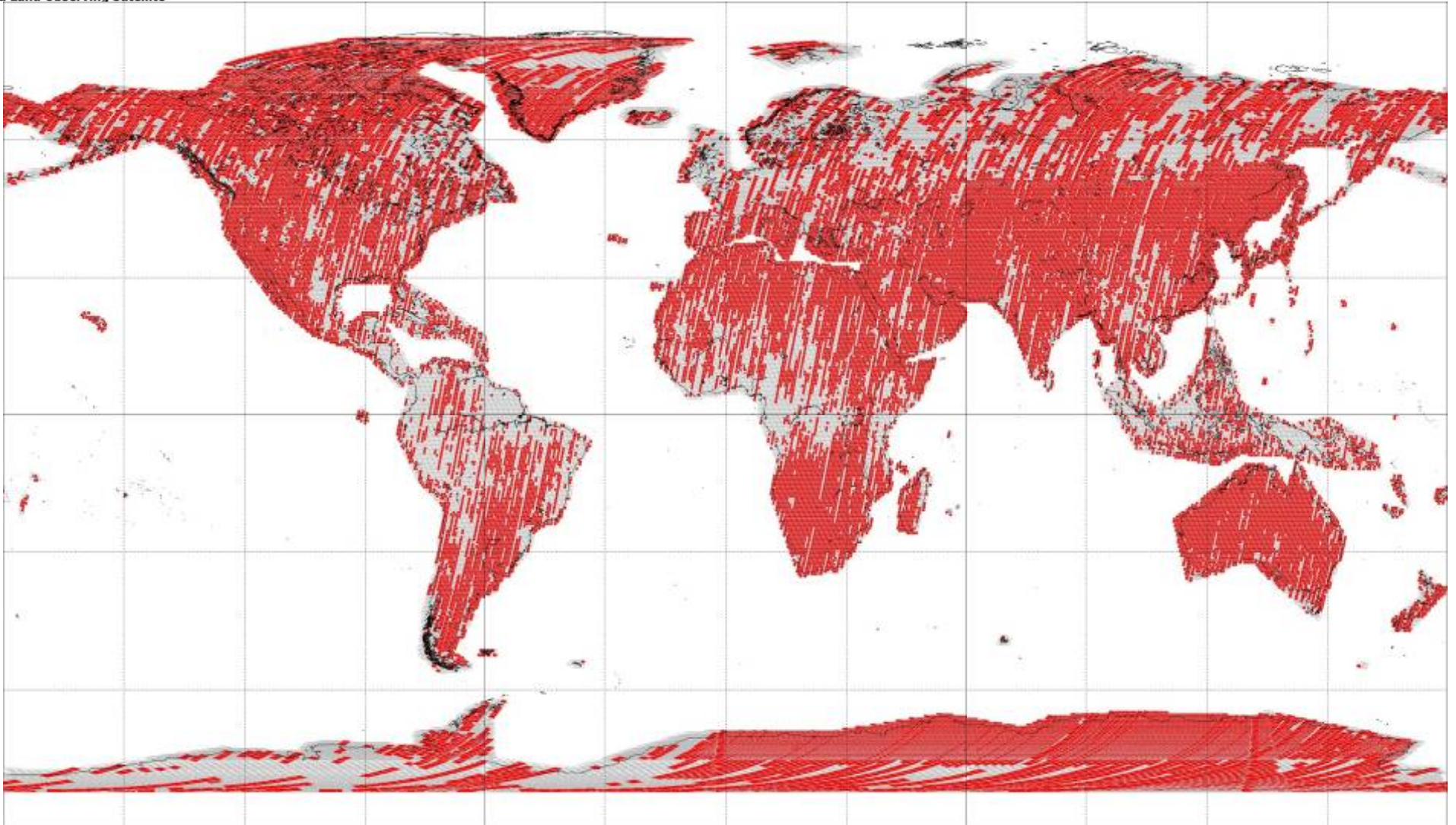
Acquisition Status of AVNIR-2



Period: from May 16, 2006 to Jan. 22, 2008

Image coverage map of AVNIR-2 based on the basic observation plan
(Cloud cover: less than 20%; spatial covered rate=68% in global)

Acquisition Status of AVNIR-2



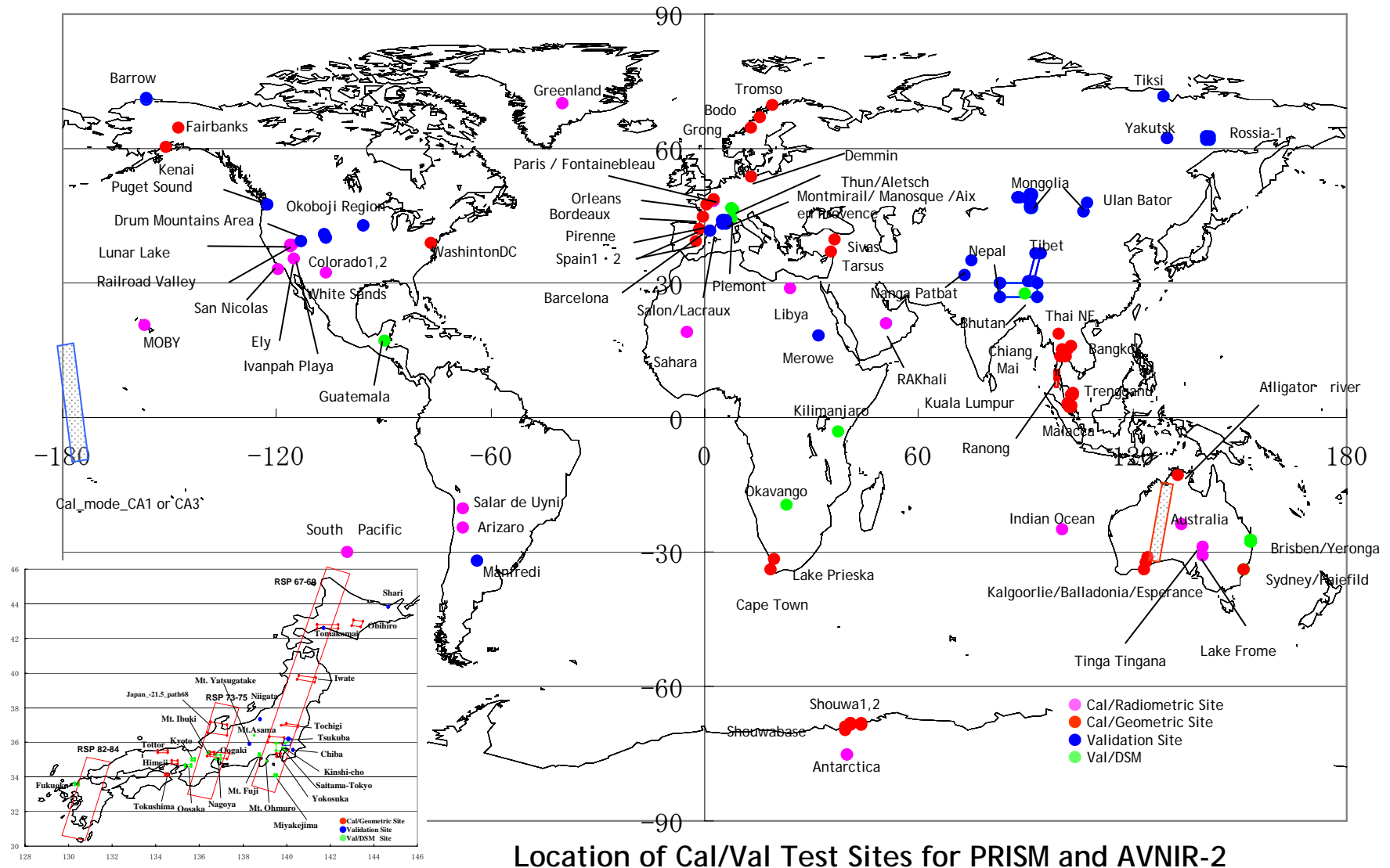
Period: from May 16, 2006 to Jan. 22, 2008

Image coverage map of AVNIR-2 based on the basic observation plan
(Cloud cover: less than 2%; spatial covered rate=53% in global)

ALOS optical Cal/Val test sites



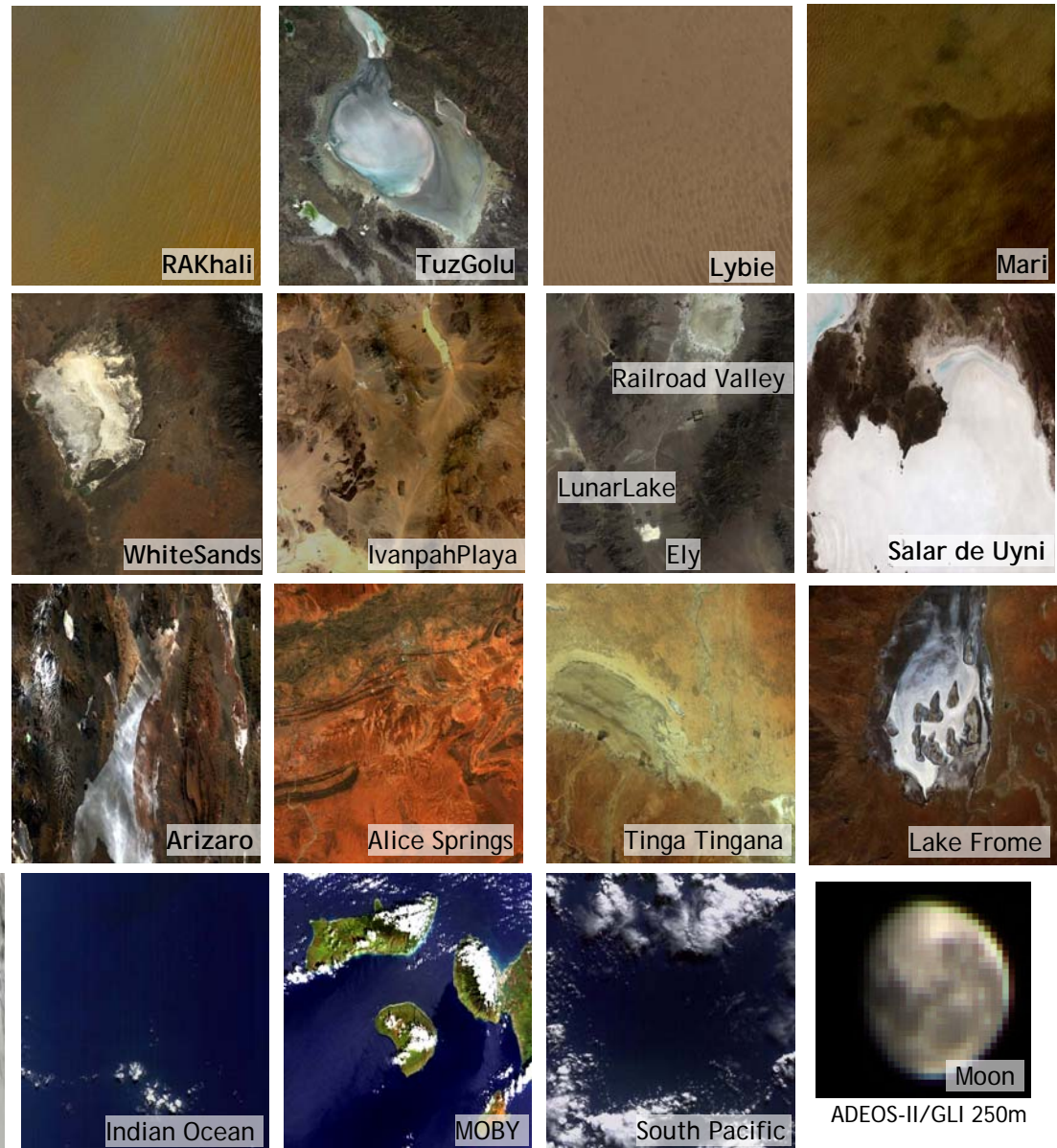
Except for Japan area, As of December 28, 2006



Location of Cal/Val Test Sites for PRISM and AVNIR-2

Radiometric (cross and vicarious) calibration sites

Test site	Center (deg)		Note
	Lat	Lon	
Asia			
RAKhali (Saudi Arabia)	21.00	51.00	150m
Tuz Golu (Turkey)	38.75	33.35	900m
Africa			
Lybie (Sahara)	28.90	23.75	120m ESA?
Mari (Sahara)	19.12	-4.85	370m ESA?
America			
WhiteSands (U.S)	32.50	-106.20	1310
Ivanpah Playa (U.S)	35.50	-115.40	890m
LunarLake (U.S)	38.40	-116.20	1910m
Railroad Valley (U.S)	38.50	-115.69	1420m
Ely (U.S)	38.33	-115.93	1500m
Salar de Uyni (Bolivia)	-20.20	-67.60	3660m ESA?
Arizaro (Argentine)	-24.57	-67.70	3570m ESA?
Oceania			
Alice Springs (Australia)	-23.70	133.80	670m
Tinga Tingana (Australia)	-29.00	139.75	14m
Lake Frome (Australia)	-30.75	139.83	2m
Polar snow field			
Antarctica	-80.00	40.00	3600m
Greenland (Denmark)	70.00	-40.00	2880m
Ocean			
Indian Ocean	-25.00	100.00	No insitu
MOBY (U.S)	20.82	-156.98	NOAA
South Pacific	-30.00	-100.00	No insitu
Space			
Moon	NA	NA	

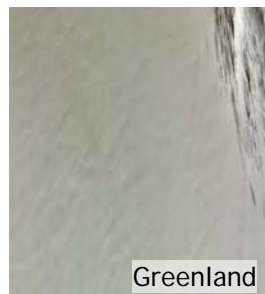


Note:

- The gain mode for CalVal conflicts sometimes to one for general observation.
- Spatially uniform sites are difficult for observing on the ground generally.
- High elevation and white-color sites are useful.



Antarctica



Greenland

← ~70km →



Indian Ocean



MOBY



South Pacific



Moon

ADEOS-II/GLI 250m

Dome-C

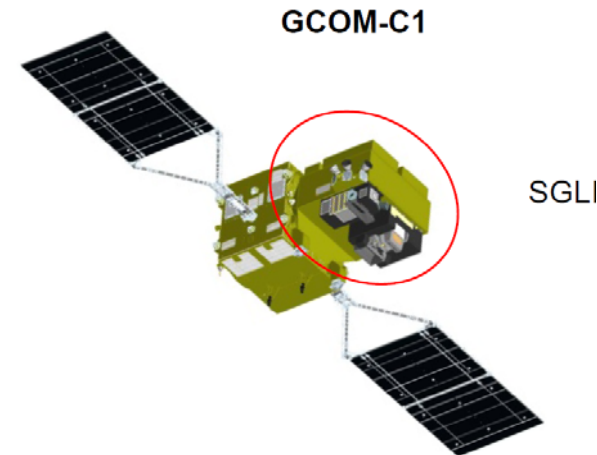


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GCOM-C1/SGLI

SGLI : Second Generation Global Imager

- Targets of GCOM-C are carbon cycle and radiation budget, and will carry SGLI.
- SGLI will continue almost of the GLI observations (sea surface temperature, ocean color, aerosols, cloud, vegetation, snow/ ice, and so on).
- The new SGLI features (250m (VN) and 500m (T) channels and two polarization/ multi-direction channels (P)) will enable improvement of land and coastal monitoring and retrieval of land aerosols.



GCOM-C SGLI characteristics

Orbit (TBD)	Sun-synchronous (descending local time: 10:30) Altitude: 798km, Inclination: 98.6deg
Launch Date	early 2014 (JFY2013)
Mission Life	5 years (3 satellites; total 13 years) Push-broom electric scan (VN & P)
Scan	Wisk-broom mechanical scan (SW & T)
Scan width	1150km cross track (VN & P) 1400km cross track (SW & T)
Digitalization	12bit
Polarization	3 polarization angles for P
Along track direction	+45 deg and -45 deg for P Nadir for VN, SW and T

SGLI channels						
CH	λ	$\Delta\lambda$	L_{std}	L_{max}	SNR at L_{std}	IFOV
	VN, P, SW: nm T: μm		VN, P: $W/m^2/sr/\mu m$ T: Kelvin		VN, P, SW: - T: $NE\Delta T$	m
VN1	380	10	60	210	250	250
VN2	412	10	75	250	400	250
VN3	443	10	64	400	300	250
VN4	490	10	53	120	400	250
VN5	530	20	41	350	250	250
VN6	565	20	33	90	400	250
VN7	670	10	23	62	400	250
VN8	670	20	25	210	250	250
VN9	763	8	40	350	400	1000
VN10	865	20	8	30	400	250
VN11	865	20	30	300	200	250
P1	670	20	25	250	250	1000
P2	865	20	30	300	250	1000
SW1	1050	20	57	248	500	1000
SW2	1380	20	8	103	150	1000
SW3	1640	200	3	50	57	250
SW4	2210	50	1.9	20	211(TBD)	1000
T1	10.8	0.7	300	340	0.2	500
T2	12.0	0.7	300	340	0.2	500