

ALOS

K&C Initiative
An international science collaboration led by JAXA

First cut systematic acquisition strategy for PALSAR-2

K&C Forest Theme input to ALOS-2 acquisition plan

KC#14

June 15, 2010

ALOS

PALSAR-2 modes

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	Spotlight	Ultra Fine	High sensitive	Possible new	Fine	ScanSAR	
Scale		Local	Local		Global	Regional	
Usage	No thanks	Selective logging/ degrad.	Biomass	No thanks	Forest & LCC	Rapid deforest. & wetlands	
Bandwidth	84MHz	84MHz	42MHz	14MHz	28MHz	14MHz	
Resolution	Rg × Az: 3 × 1m	3m	6m	20m	10m	100m	
Orbit determination	1m	1m	40cm	40cm	40cm	40cm	
Swath	Rg × Az: 25 × 25km	50km	50km (25km FP)	60-70 km	70km (35km FP)	350km	
Polarization	(HH or V or HV or VH)	SP/DP	SP/DP/FP/CP	FP	SP/DP/FP/CP	SP/DP	
Data rate	800Mbps	800Mbps	800Mbps		400Mbps	400Mbps	
NESZ	-24dB	-24dB	-28dB	?	-26dB	-26dB	
S/A	Rg	25dB	25dB	23dB	?	25dB	25dB
	Az	20dB	25dB	20dB	?	23dB	20dB

ALOS-2 Workhorse modes for systematic global forest monitoring

- Fine Beam Dual-pol, 10m @28MHz
- ScanSAR Dual-pol, 100m @14MHz

The top banner features satellite imagery of a river delta system, likely the Amazon, with the word "ALOS" in large white letters on the left. The text "K&C Initiative" and "An international science collaboration led by JAXA" is on the right.

ALOS

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“What can be done with ALOS-2 that cannot be done with ALOS?”

Mr. Doura, JAXA Exec. Dir. at ALOS-2 WS, Feb. 2010

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For example:

- Coherence
 - JAXA standard product?
- ScanSAR/ScanSAR Interferometry
- ScanSAR dual-pol

- Very high resolution modes (3-6 m) for degrad
- (Pol-InSAR?)

ALOS-2 key points

- 12.00 am/pm orbit
- 14 day repeat cycle
- 193 km between ground tracks
- Incidence angle range: 30° ~ 44° (F2 beam)

- 3 cycles (42 days) required for regional FB coverage (70 km)
- 4 cycles (66 days) required for regional high res coverage (50 km)
 - 1 cycle (14 days) for regional ScanSAR coverage (350 km)
 - ScanSAR, 80% overlap between neighbouring tracks

Recommendations for ALOS-2 (presented at ALOS-2 mtg Feb 2010)**Key modes:**

- **Fine-Beam HH+HV (Global monitoring BOS mode)**
2 global coverages/year at wet/dry (winter/summer) seasons (=ALOS-1 BOS)
The above including 1 InSAR coverage/year (new)
- **ScanSAR HH+HV (Regional monitoring BOS mode)**
Every second cycle (28 days) monitoring over key regions (=ALOS-1 BOS)
- **High-sensitive Full-pol (Hot-spot monitoring)**
On-demand as required
- **Ultra-fine Dual-pol (Hot-spot monitoring)**
On-demand as required

Forest session 15 June 2010

KC#14 recommendations from Forest Theme members

- Systematic forest monitoring (FBD 10 m)
 - 2 global dual-pol forest covers/year
 - Plus one additional regional coverage over certain areas with “complex” seasonality
 - Increased monitoring over certain geographical regions? (see wetlands discussion)
 - Where to apply InSAR? How often?
 - Obtain ONE 14-day GLOBAL InSAR baseline at beginning of ALOS-2 mission
 - Boreal regions: 14-day InSAR every winter
 - Temperate: same boreal
 - Savanna/woodlands: 14-day InSAR during dry season once/year (?)
 - Tropical – 14-day InSAR of questionable use. Possible better to maintain 42-day sampling

- Ultra Fine (6m, full-pol)
 - Pol-InSAR: One regional baseline coverage at beginning of mission (8 cycles required)
Obtain ONE 14-day GLOBAL InSAR baseline at beginning of ALOS-2 mission

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KC#14 recommendations from Forest Theme members

- Seasonality (FB mode)
 - Same as for PALSAR or more adapted to regional seasonality (more complex acq. plan)
 - Keep same major windows as PALSAR
 - make minor regional adjustments within windows
- Regional monitoring (ScanSAR HH/HV)
 - One global ScanSAR coverage/year
 - Boreal zone: spring thawing needs to be covered at 14-repeat
 - Deforestation monitoring (e.g. tropical belt): 28-days repeat year around
 - Biomass mapping (boreal & savanna zones): 1-year 28-day repeat

Wetlands session 17 June 2010

KC#14 recommendations from Wetlands Theme members

- Fine beam Dual-pol
 - 2 global dual-pol forest covers/year (same as forestry)
 - Increased monitoring over certain geographical regions
 - Pantanal +2 additional times/year
 - Central Africa (+/- 20 deg)
 - Kalimantan/SE-Asia (?)
 - Amazon (during rising waters for monitoring of aquatic veg)

Wetlands session 17 June 2010

KC#14 recommendations from Wetlands Theme members

- Regional monitoring (ScanSAR HH/HV)
 - 1st prio
 - Inundation monitoring (revised KC wetland polygons? + possible new): 28-days repeat year around continuously
 - Increased frequency during El Nino/la Nina (possible?)
 - (14-day repeat during critical peak seasons not considered of prime importance)
 - Prio 1 regions: Northern South America, Central Africa (including Sudd, +/- 20 deg, incl whole Congo basin), SE-Asia & PNG,
 - Prio 2 regions: Okavango, Zambezi, Murray-Darling, Northern Australia, China/India rice, Central America, SE-USA, Siberia, Alaska, Canada(?), West Africa
 - Prio 3 regions: Tibet, Mesopotamian marshes, Niger delta