The advanced Land Observing Satellite(ALOS) and JAXA Plan for follow-on missions

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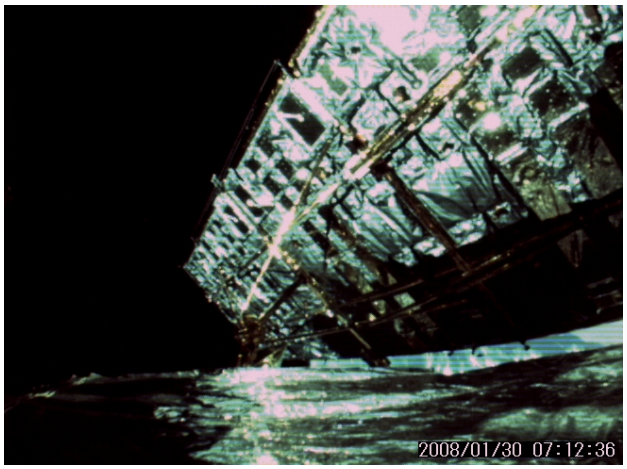
Earth Observation Research Center
Japan Aerospace Exploration Agency

GEOSS meeting, April 15 2008

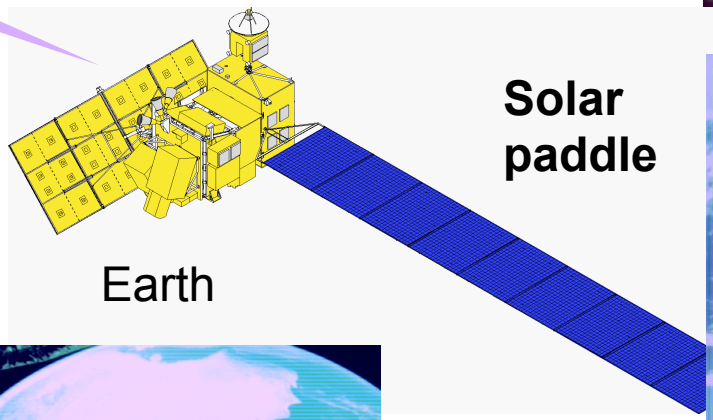
ALOS and its pictures



PALSAR Antenna backside

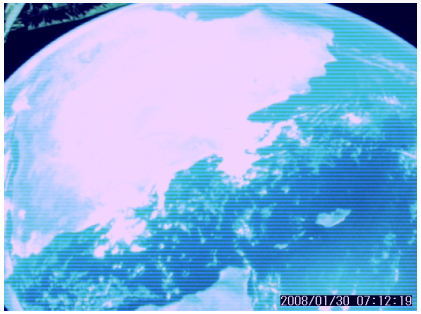
Jan. 30 2008

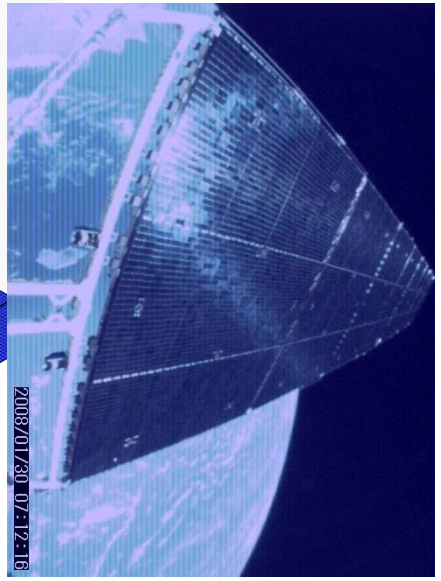
Antenna for Inter satellite communicatio n



Earth

Solar paddle



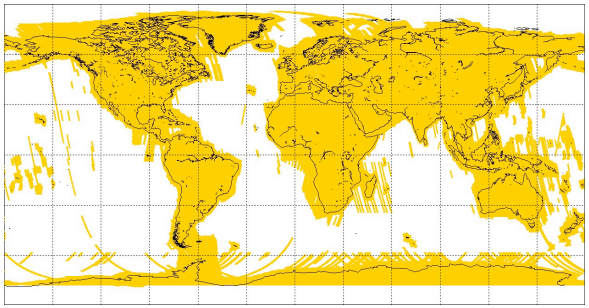


ALOS operation status (3/3)

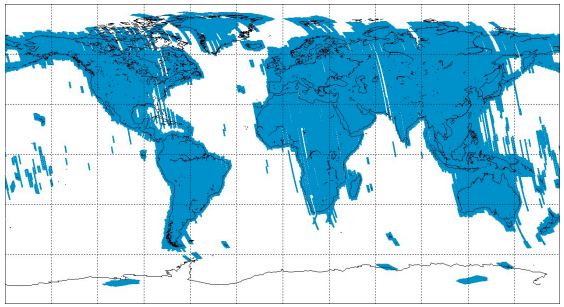
Operation status of each sensor
Observation results
Duration : 2006/5/16 (CAL/VAL) ～2008/3/8 (17cycles)
Following images contains all the operation modes.

	Total number of scenes	Cloudless scenes
PRISM	918, 144	316, 351
AVNIR-2	418, 092	127, 341
PALSAR	723, 801	—

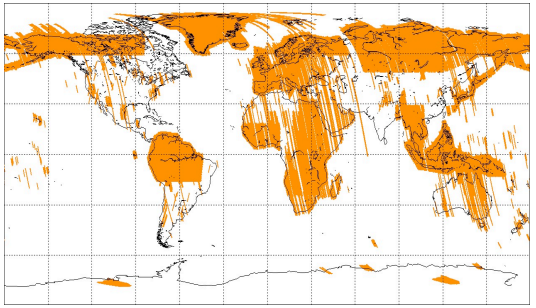
8 times global covers by PALSAR.



FBS



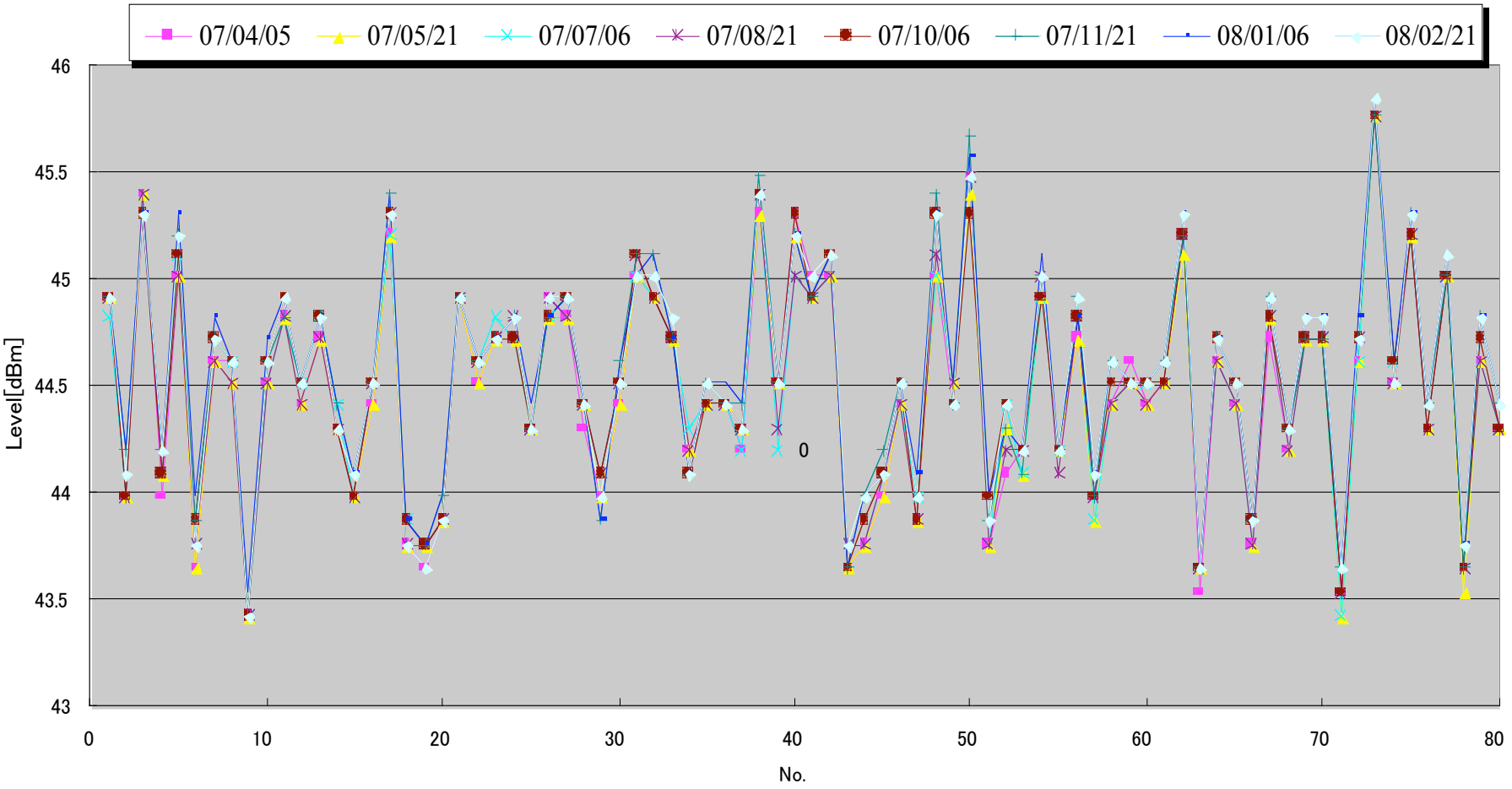
FBD



PLR

PALSAR is very stable.

PALSAR Transmission power monitor



PALSAR Power monitor results (80 T/R modules)

- Total Power>=2200W (Spec=2000W)
- No degradation measured.

1)ALOS-TDRScommunication test

1. **Goal : communication test between ALOS and TDRS**

2. **Plan ALOS-TDRS(F-10) communication test（Ka）**

   ALOS->TDRS F-10 ->WSC ->ASF

3. **Schedule May 29 2008 3 passes(June 5 ,3 passes(backup))**

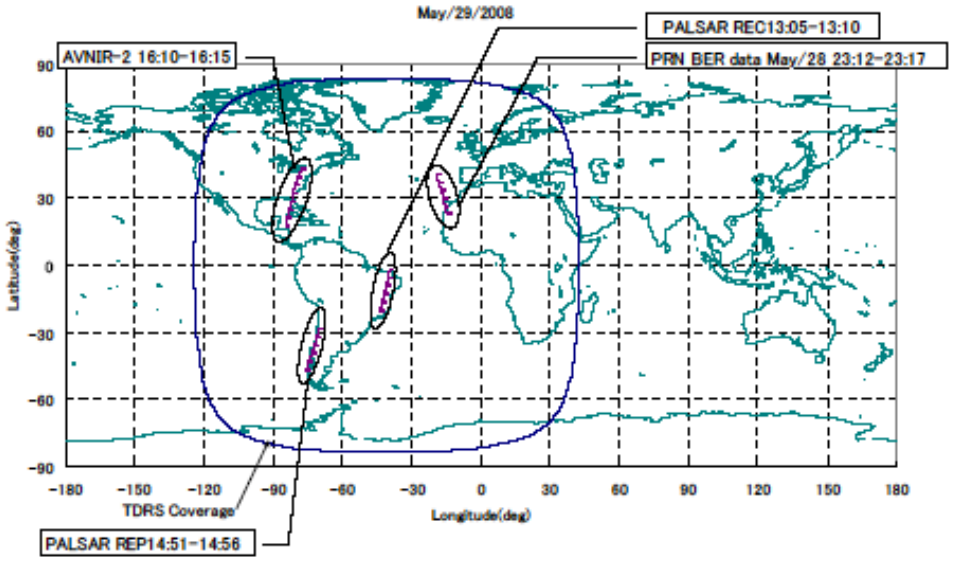
(Data：ＰＮ,ＰＡＬＳＡＲ,ＡＶＮＩＲ-2**)**

（White Sands Complex） （Alaska Satellite Facility）

2)Orbit maneuver

June beginning: maintain the orbital plane (inclination)

> tuning the inclination.



Amazon Deforest Watch (Mato Grosso) JERS-1 & ALOS

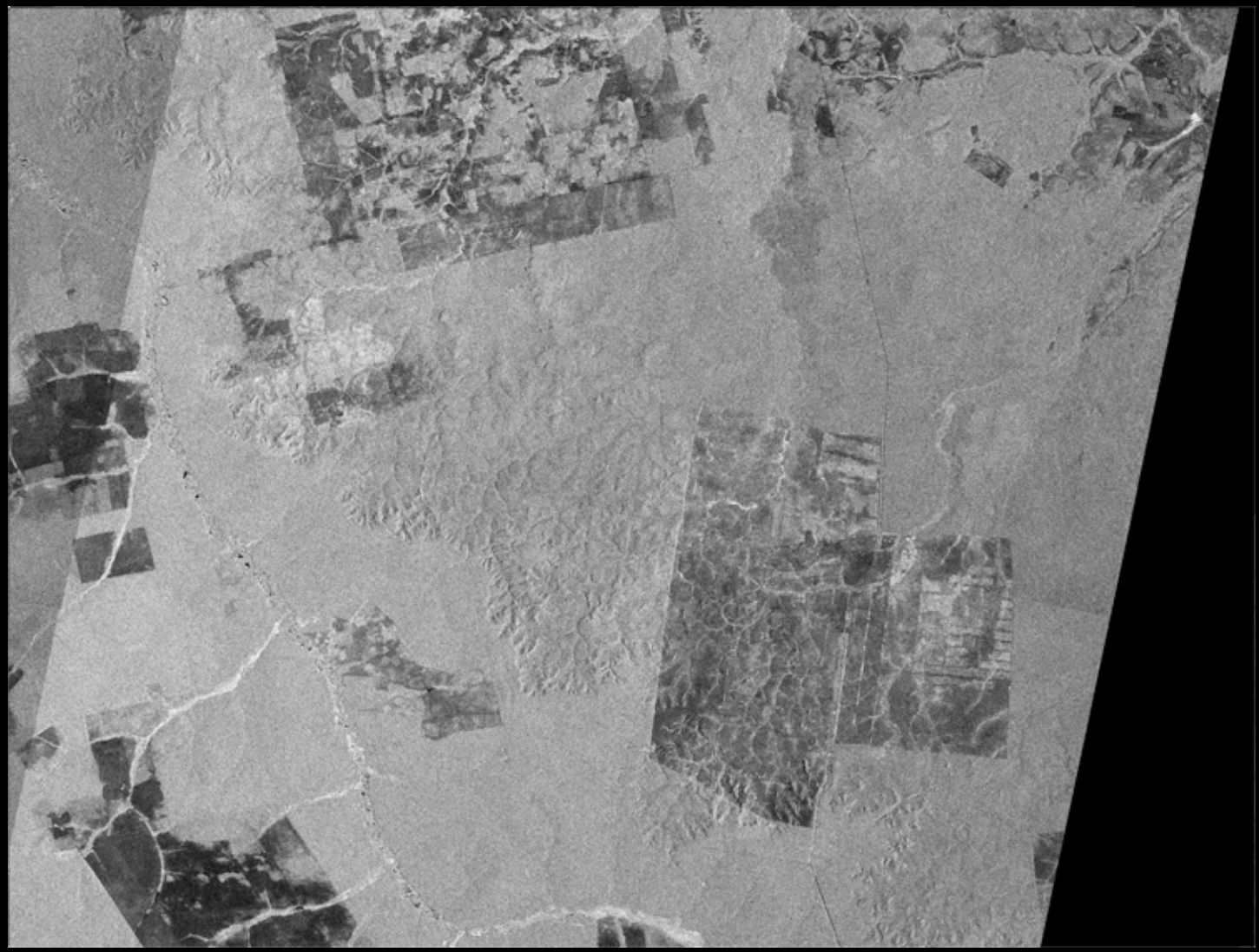
Acquisition Term

1992/11/9
～2007/6/25

JERS-1
- 1992/11/9
- 1992/11/10
- 1996/5/8
- 1996/5/9

ALOS
- 2006/8/12
- 2007/6/25

Lat : S 2°34’
Lon : W 54°45’



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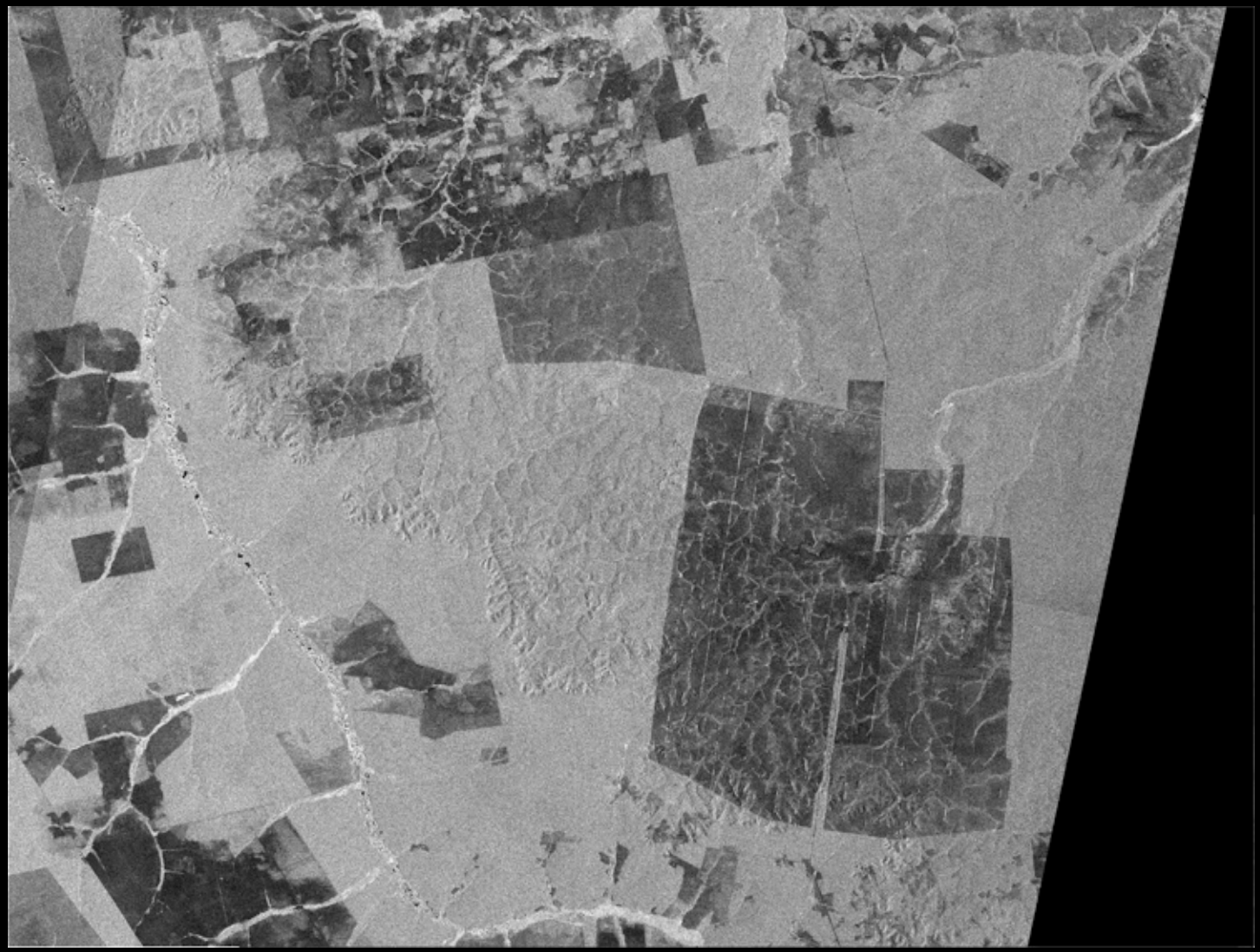

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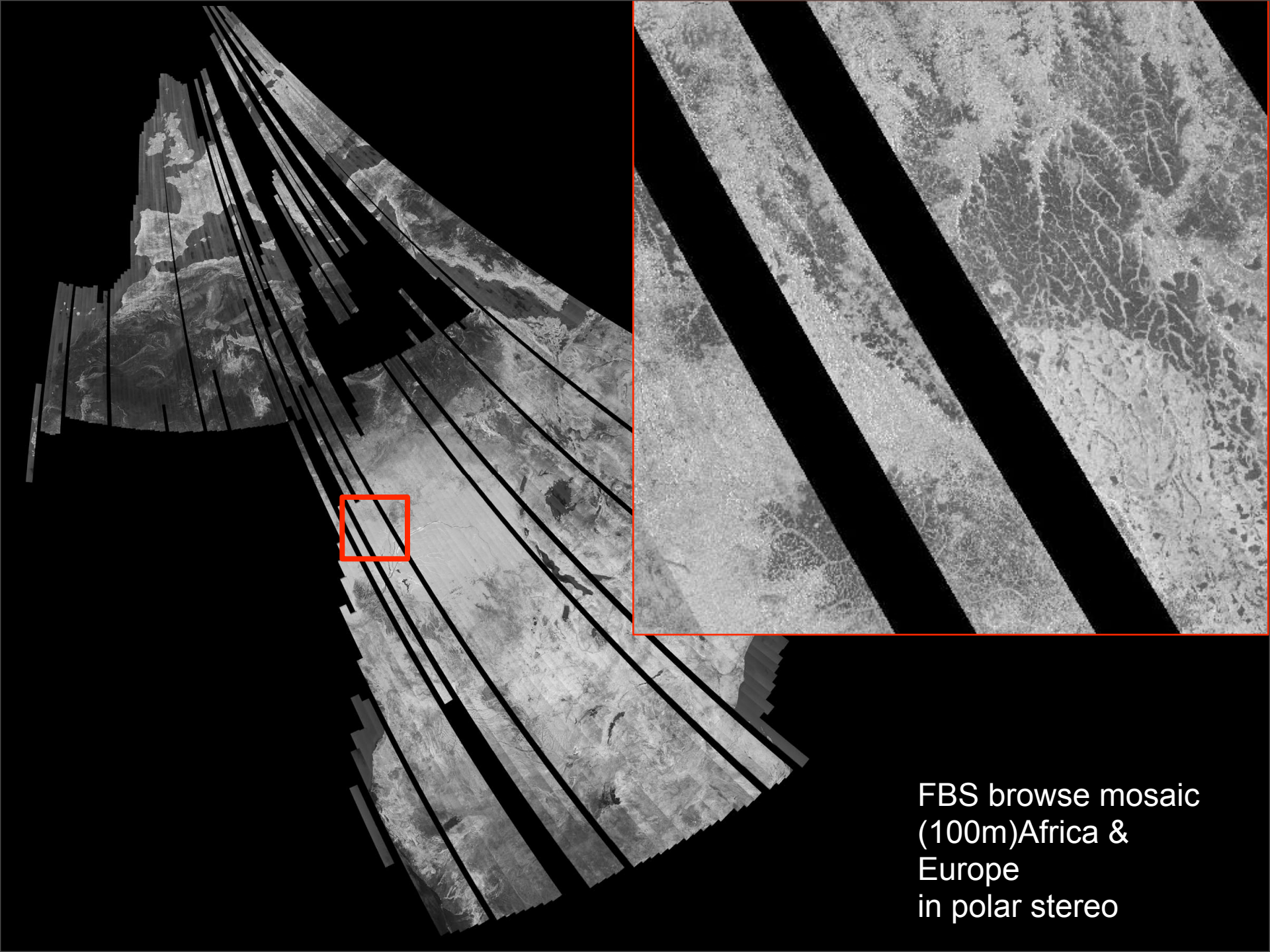
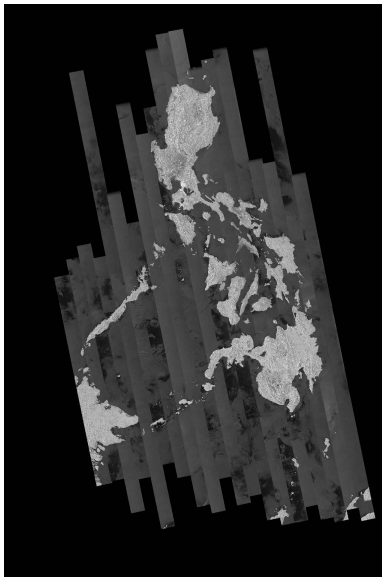
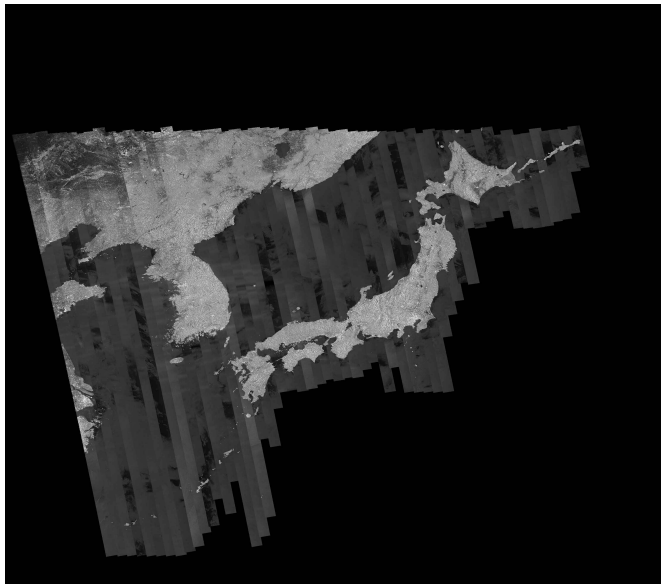
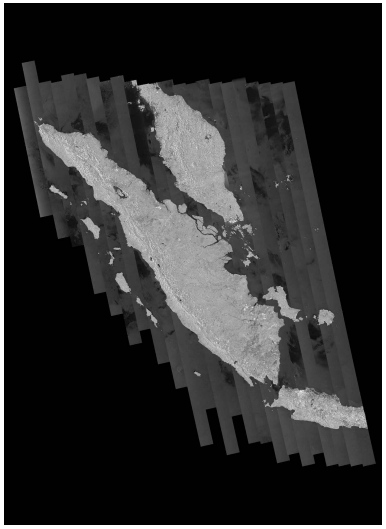


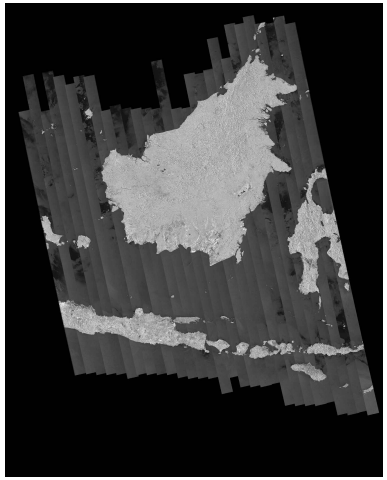
FBS browse mosaic (100m)Africa & Europe in polar stereo

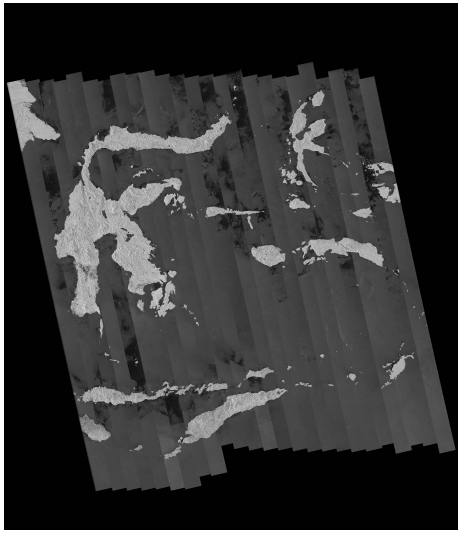
Current Mosaic products

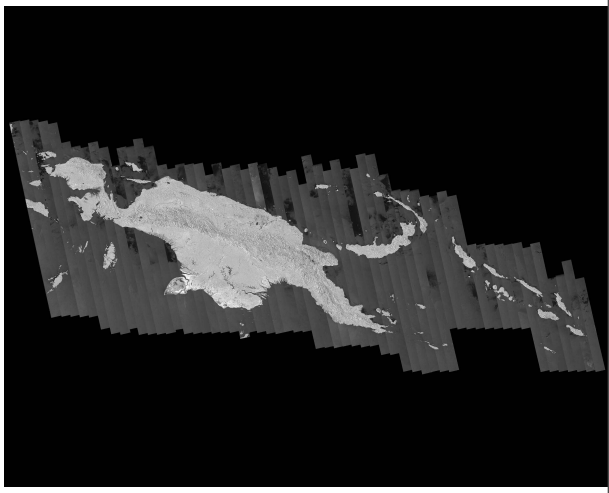




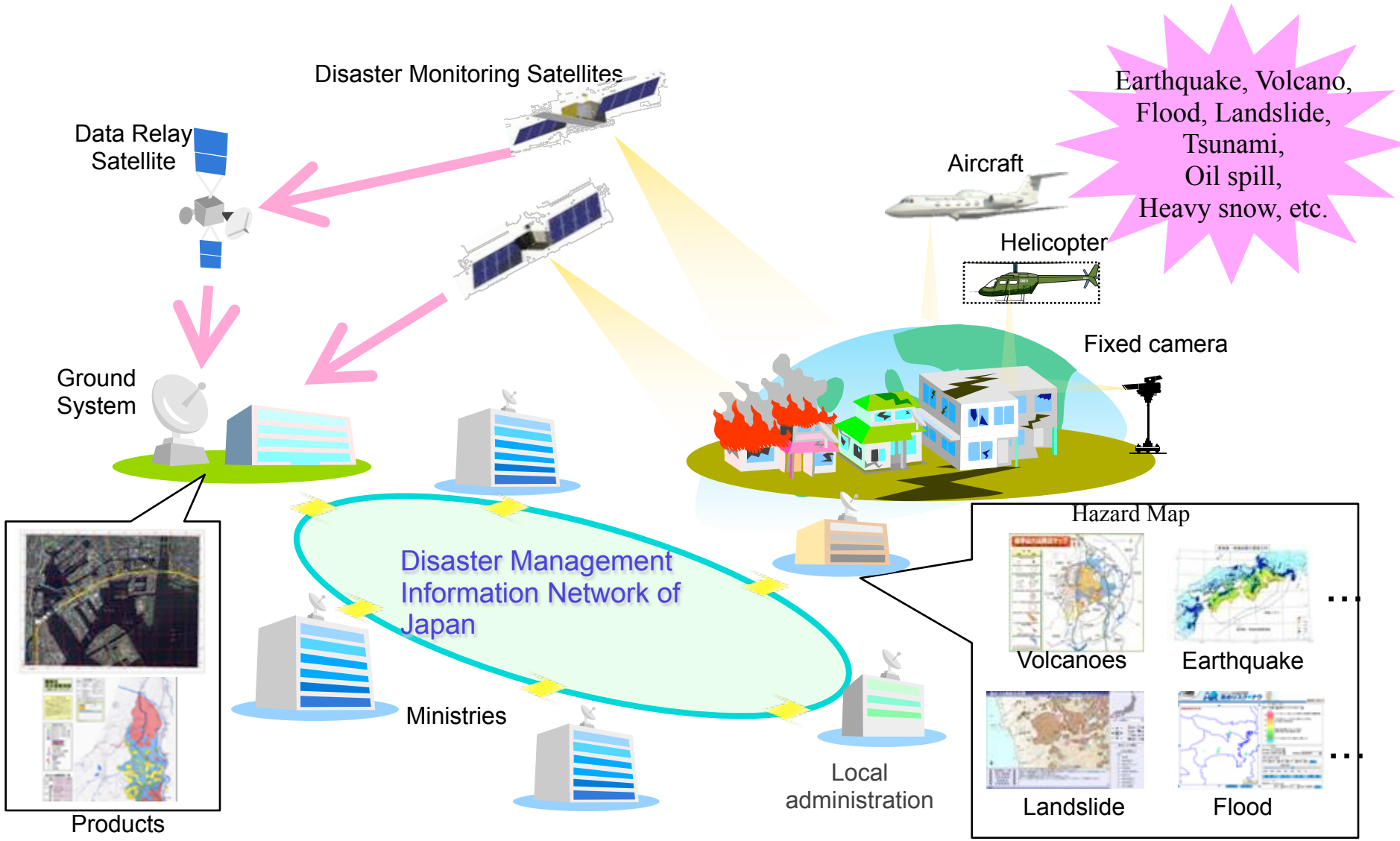






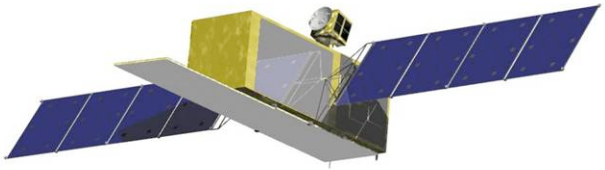


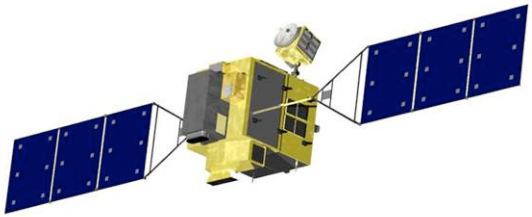
Disaster Monitoring System



Core System (2 SAR + 2 OPT)

- **Satellite**
  - SAR satellite
    - GSD: 3m (strip map), 3m*1m (spotlight
    - Swath: 50km
    - L-band
  - Optical satellite
    - GSD: 1m (Pan), 4m (Multi-spectral)
    - Swath: 50km
  - First satellite: launch target JFY2012





- **Ground System**
  - Quick response
    - Quick tasking (less than 1 hour)
    - Quick data processing and analysis (less than 1 hour for standard proc.)
  - Compatible with the existing information systems of Japanese governmental users

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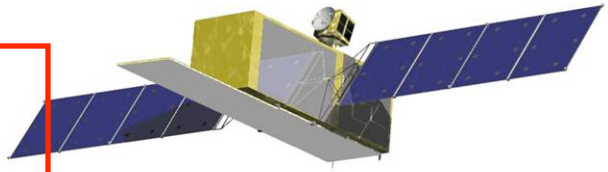

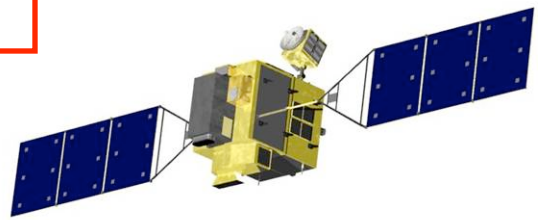

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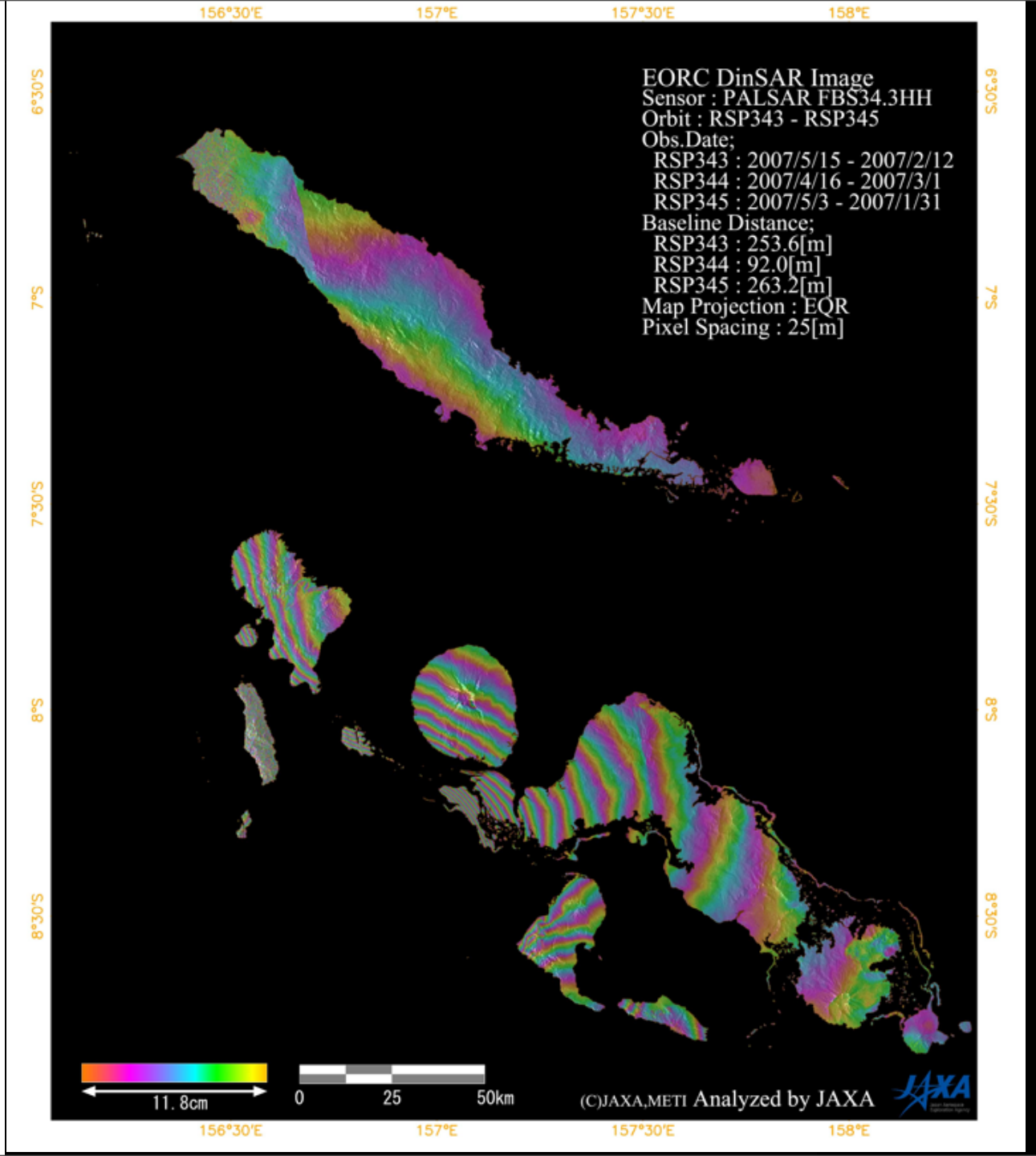
Solomon Earthquake

M8.1
April 2 2007

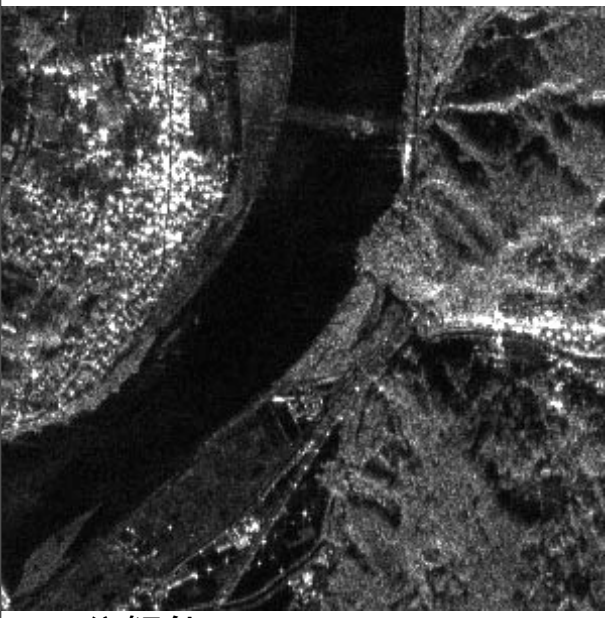
Three DinSAR
344:4/10-2/23
345:5/3-1/31
343:5/10-2/12

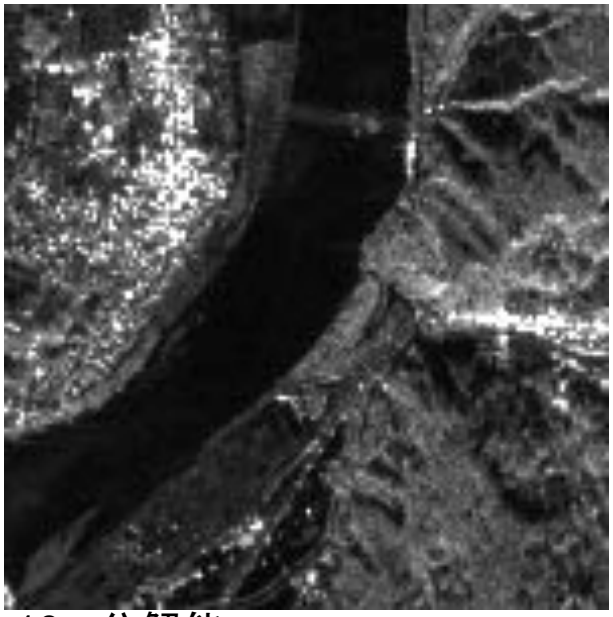
FBS343HH

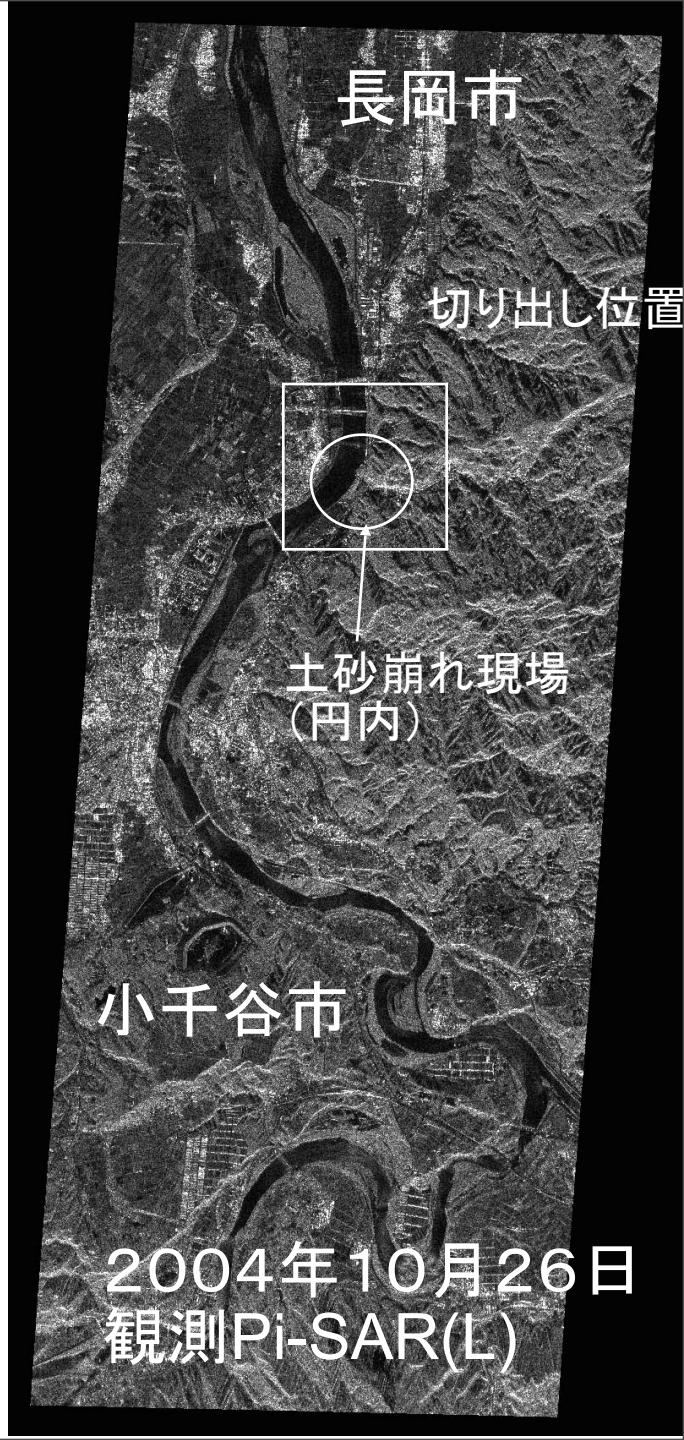
No orbit tuned.
No further corrected.
Three paths overlaid.



Land slide of Chuetsu Earthquake 2004







Requirements to the SAR missions

- Change detections
- InSAR - Orbital maintenance (500m tube and frequent inclination maintenance)
  - coherence amplitude / phase change
- Polarizations

- First Target

Deformation, flooding, volcano, land slide, subsiding, forest fire, etc.

-> High resolution, good NESZ -> High quality SAR

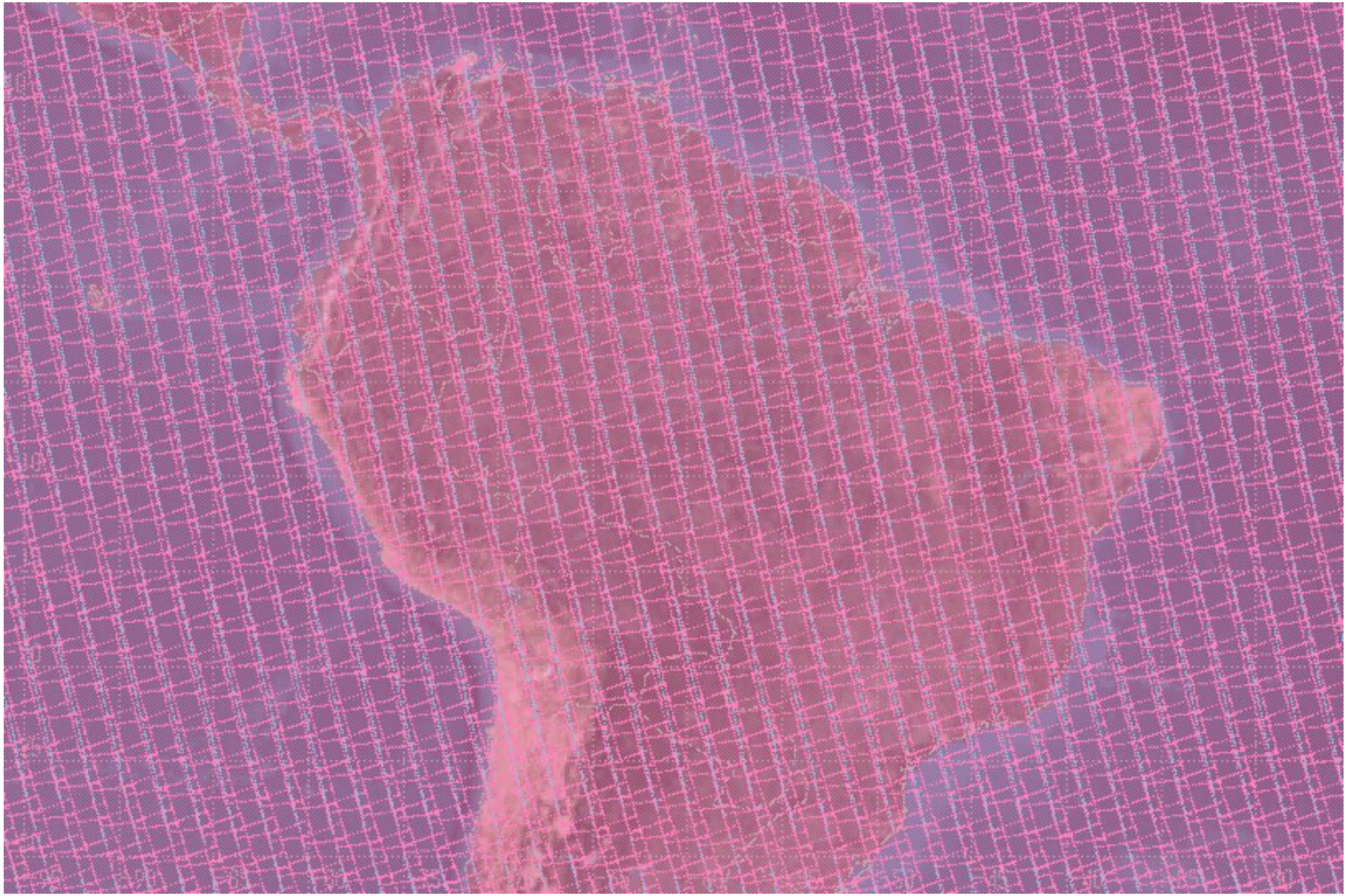
- Second target

Forest and wetland

-> PALSAR performance + adding HV -> Mid-quality but wide swath SAR

SAR Parameters (Under discussion)

Frequency	:	L band
BW	:	<85MHz, 42MHz, 28 MHz
Modes	:	Spot light, Strip, SCANSAR
Pr	:	<6Kw
Swath	:	50 km ~ 70 km, 300km(SCAN)
Pol.	:	HH, HH+HV, HH+HV+VH+VV
Resolution	:	1m, 3m, ~PALSAR(5m), 1 look
Data rate	:	< 800 Mbps
Orbit revisit	:	14 days, 628 km (14+3/14)
Bit	:	4 bit I&Q, 2 bit I&Q(BASQ)
Incidence	:	7 deg. ~ 70 deg. (30 ~ 45 deg. for forest)
DRTS	:	TBD (under discussion)
NESZ	:	<-28 dB (20~40 degrees)
Amb (Rg, Az):		>23 dB
Dual beams	:	Yes (1, 3 meter size)
Look dir.	:	Right and Left



Amazon mapping in ascending (each swath 30~45 deg.)

Conclusions

1) Forest monitoring using the PALSAR is ongoing.
   PALSAR is in good condition.
   More than 10 years life (fuel) expected.

2) ALOS follow-on satellite system is under designing.
   Missions:
   +)Disaster mitigation(flooding, deformation, earthquake, volcanoes,,)
   +) Forest and wetland monitoring

3) L-band SARs (JERS-1, PALSAR, ALOS follow-on) will contribute the change detection for the forest.

JERS-1 : 568 km, 44 days
ALOS : 691.5 km height: 46 days revisit
ALOS follow-on:628 km height, 14 days revisit