JAXA Activities in Earth Observation

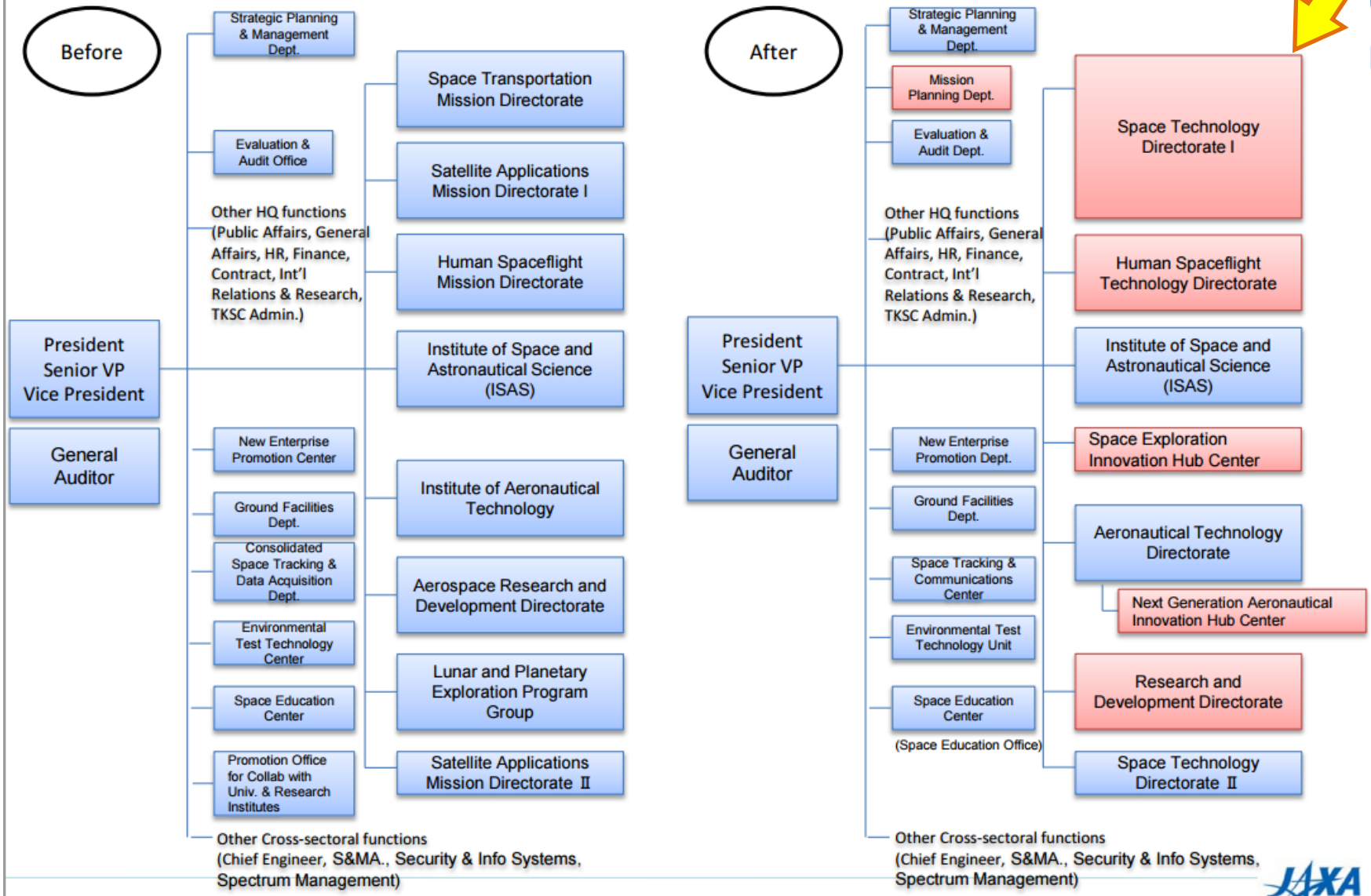
Ichiro Naito

Director
Satellite Applications and Operations Center (SAOC)

Space Technology Directorate I / Satellite Applications and Operations Center

- **Organization**
- **Line-up**

JAXA's Reorganization dated April 2015



Main points of reorganization are marked in RED.

Organizational Structure

Shizuo Yamamoto

Vice President & Director General

(2015 CEOS Chair)

Chu Ishida (CEOS Contact)

T.Ujino

Senior Chief Officer of Space Technology Development

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K. Nakagawa

Senior Chief Officer of Satellite Systems Development

- **GCOM Project Team (M. Mokuno)**
- **EarthCARE/CPR Project Team (E. Tomita)**
- **Program Management and Integration Department (A. Fukatsu)**
- **SLATS Project Team (M.Sasaki)**
- **GOSAT-2 Project Team (S. Suzuki)**

Senior Chief Officer of Space Applications

- **GPM/DPR Project Team (K. Furukawa)**
- **Earth Observation Research Center (T. Nakajima)**
- **Satellite Navigation Unit (H.Noda)**
- **ALOS-2 Project Team (S. Suzuki)**
- **Satellite Applications and Operations Center (I. Naito)**

I.Naito

Satellite Applications and Operations Center

Main Roles

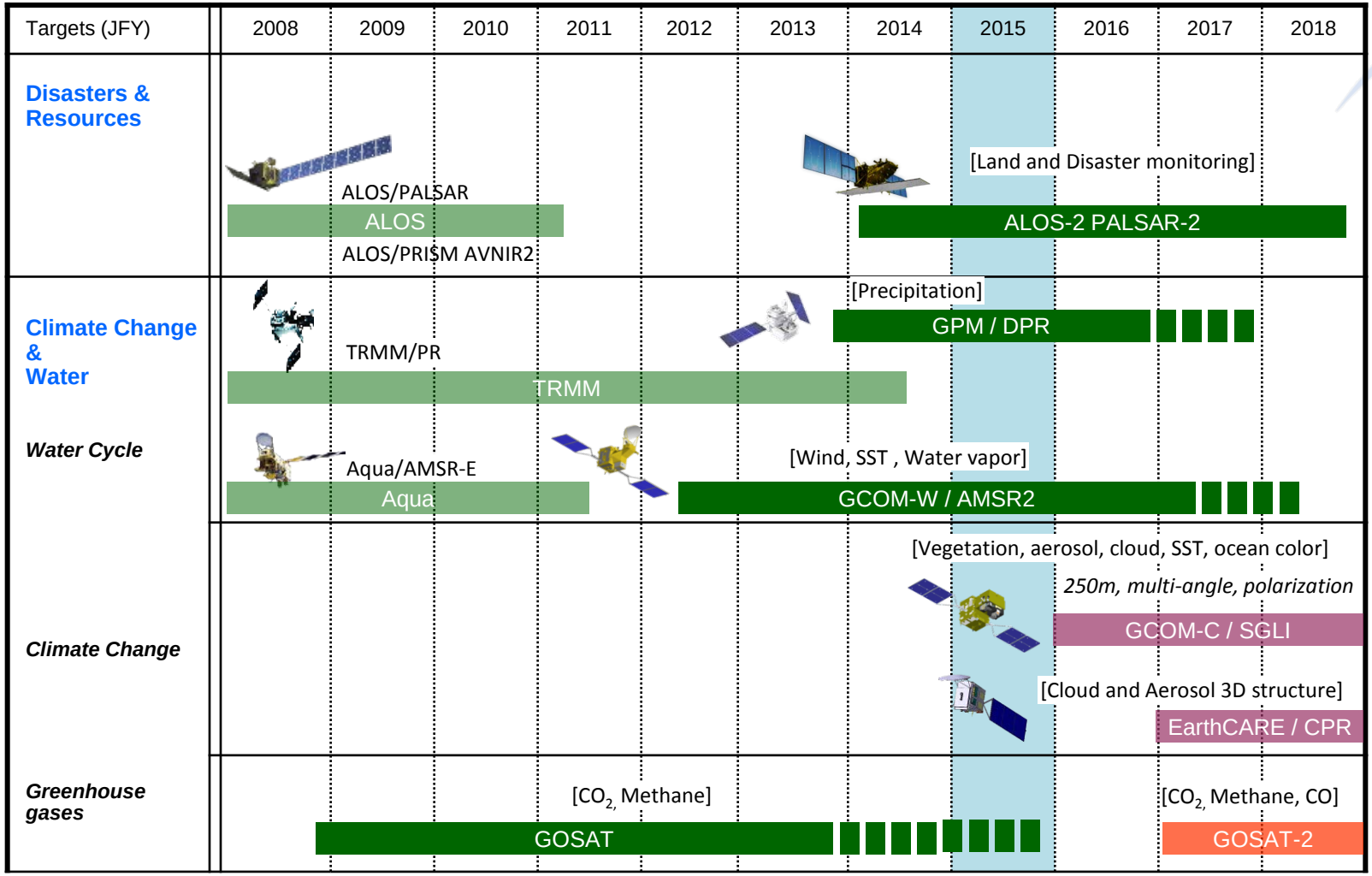
1. Promote satellite data utilization

- Support public/private sectors efforts to solve issues by using satellite data
- Develop and operate systems for disaster prevention/mitigation, including emergency operation for major domestic/foreign disasters
- International coordination and cooperation with Asian countries
- Promote satellites utilization in various fields

2. Develop, operate and maintain satellites ground systems

- Develop, operate and maintain Earth observation satellites ground systems, including TT&C, data processing, data storage and data distribution
- Develop, operate and maintain communication and navigation satellites TT&C system
- Coordination with external bodies, evaluation of new technologies and technological trend related to the above

JAXA Earth Observation Satellites



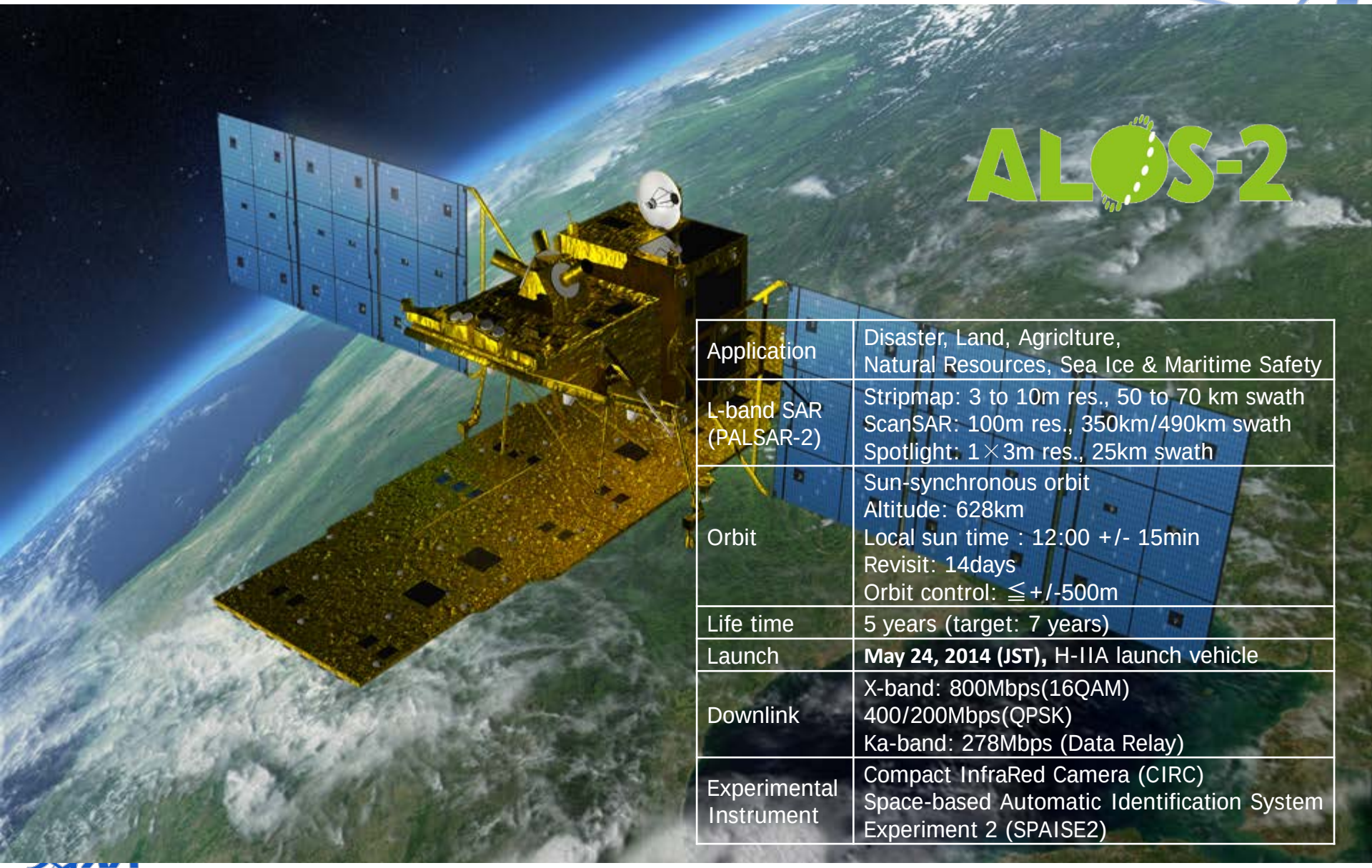
Mission status: On orbit | Phase C/D | Phase A/B

On-Orbit & Future Missions

Earth Observation

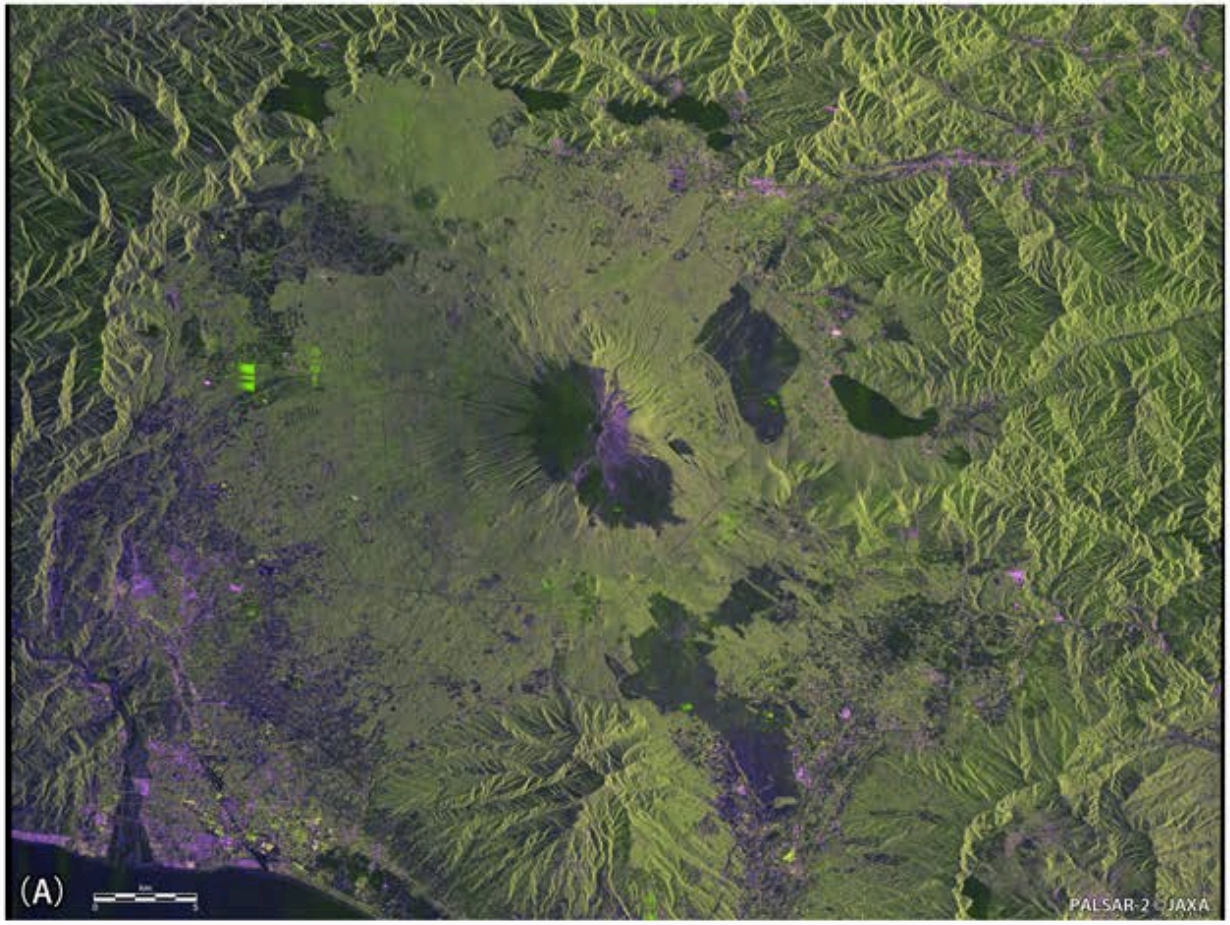
- **ALOS-2**
- **GPM/DPR**
- **GCOM-W/C**
- **EarthCARE/CPR**
- **GOSAT/GOSAT-2**

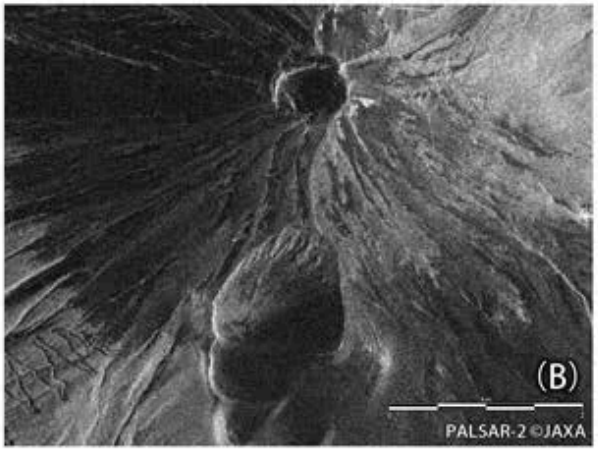
ALOS-2: Advanced Land Observing Satellite -2



Application	Disaster, Land, Agriclture, Natural Resources, Sea Ice & Maritime Safety
L-band SAR (PALSAR-2)	Stripmap: 3 to 10m res., 50 to 70 km swath ScanSAR: 100m res., 350km/490km swath Spotlight: 1×3m res., 25km swath
Orbit	Sun-synchronous orbit Altitude: 628km Local sun time : 12:00 +/- 15min Revisit: 14days Orbit control: ≦+/-500m
Life time	5 years (target: 7 years)
Launch	**May 24, 2014 (JST),** H-IIA launch vehicle
Downlink	X-band: 800Mbps(16QAM) 400/200Mbps(QPSK) Ka-band: 278Mbps (Data Relay)
Experimental Instrument	Compact InfraRed Camera (CIRC) Space-based Automatic Identification System Experiment 2 (SPAISE2)

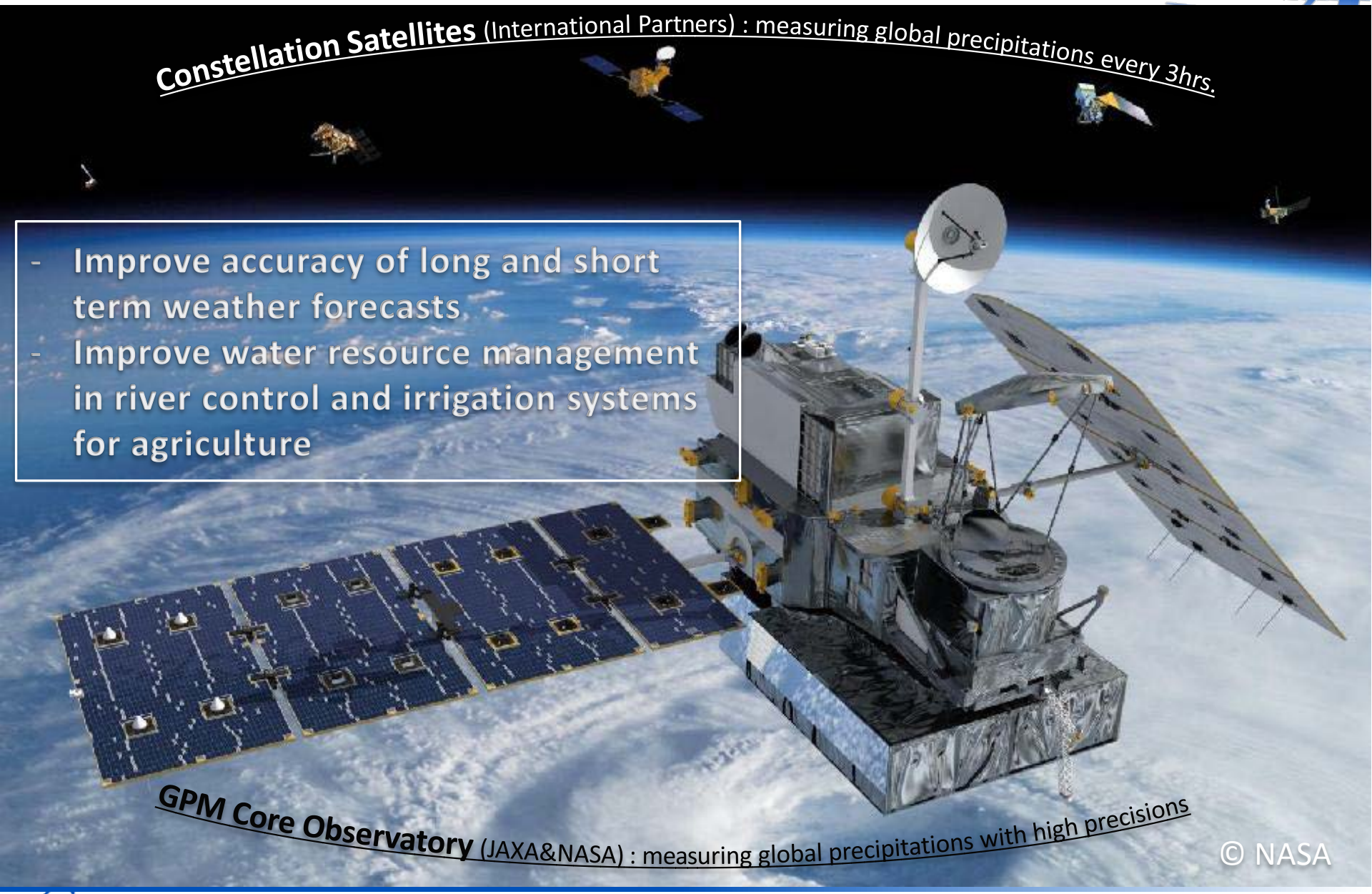
First Image of ALOS-2/PALSAR-2 (Mt. Fuji)



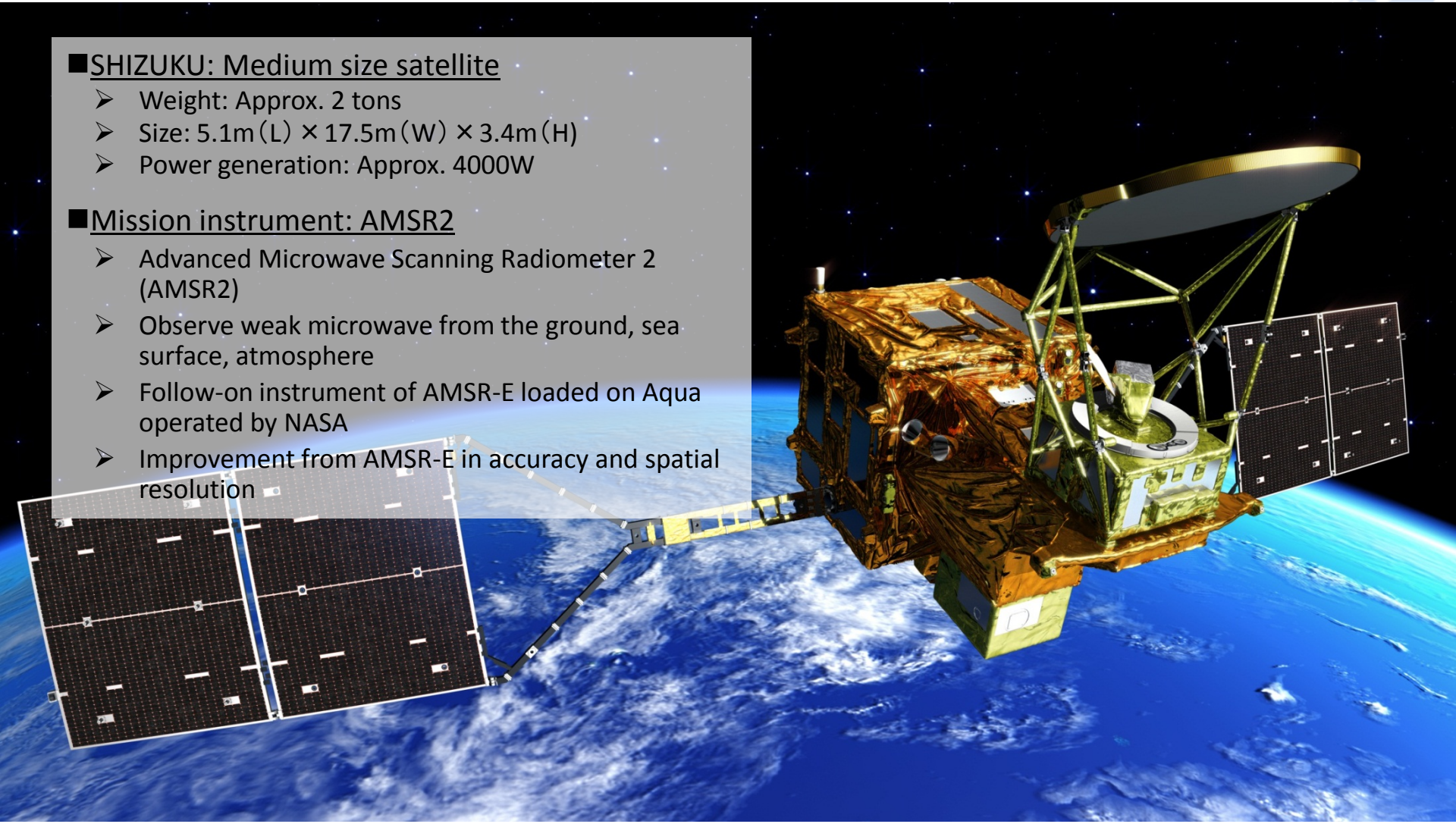


First Image of ALOS-2/PALSAR-2 (Mt. Fuji)

GPM: Global Precipitation Measurement



GCOM-W: Global Change Observation Mission - Water



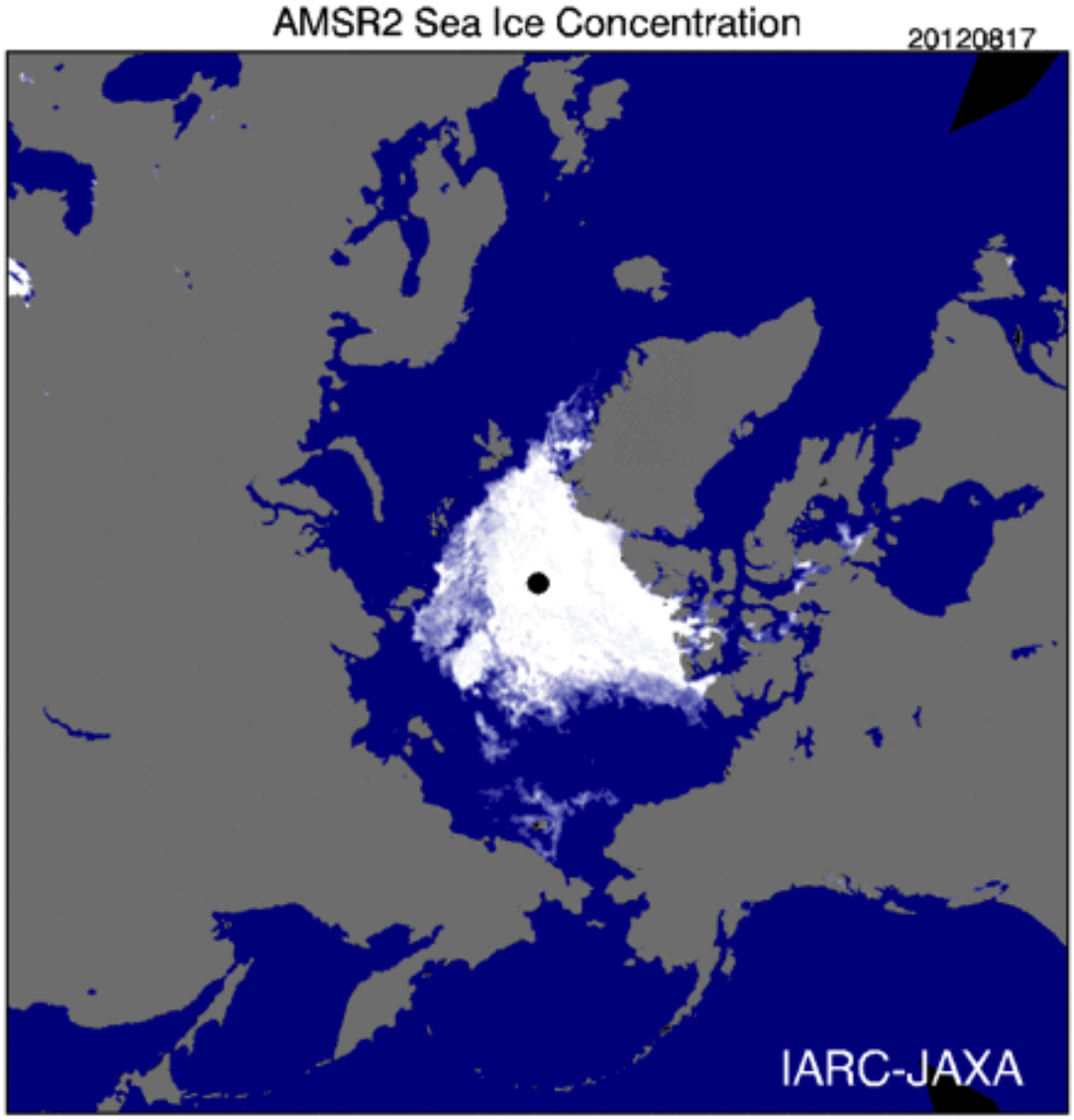
■SHIZUKU: Medium size satellite

- Weight: Approx. 2 tons
- Size: 5.1m（L）×17.5m（W）×3.4m（H)
- Power generation: Approx. 4000W

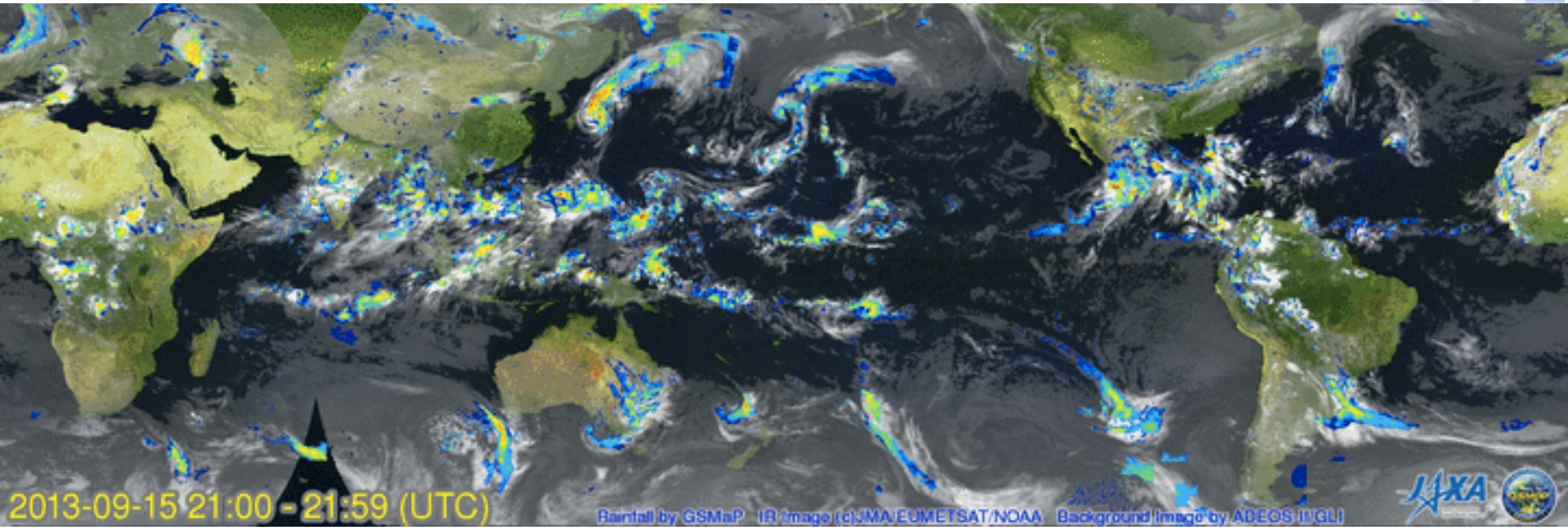
■Mission instrument: AMSR2

- Advanced Microwave Scanning Radiometer 2 (AMSR2)
- Observe weak microwave from the ground, sea surface, atmosphere
- Follow-on instrument of AMSR-E loaded on Aqua operated by NASA
- Improvement from AMSR-E in accuracy and spatial resolution

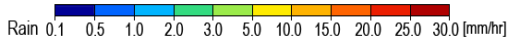
Distribution of Arctic Sea Concentration by GCOM-W



GSMaP (Global Satellite Mapping of Precipitation)



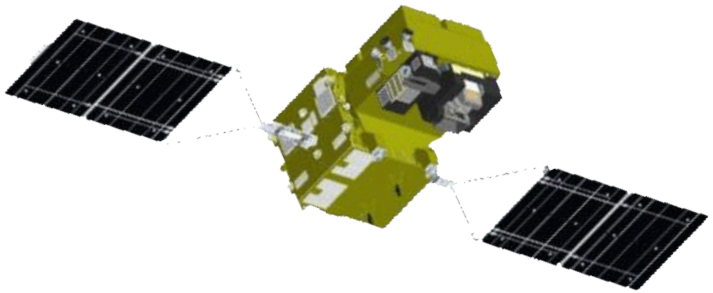
Hurricane Ingrid/Manuel: Sep. 2013 (Big impact in Mexico)



- Rapidly changing precipitation phenomena need frequent observations.
- Global rainfall map merging TRMM, polar orbiting microwave radiometer/sounders, and geostationary infrared radiometers.

http://sharaku.eorc.jaxa.jp/GSMaP/

GCOM-C: Global Change Observation Mission - Climate



Satellite under development…

GCOM-C

- Target Launch: 2016
- Main Instrument: SGLI (Second-generation GLobal Imager)
- Observe aerosols and clouds, as well as vegetation and temperatures in the land and ocean region
- SGLI-derived phytoplankton, aerosol and vegetation activity will be used for mapping fisheries, monitoring crop growth and estimating crop yield

EarthCARE/CPR – Cooperation with ESA

To reduce the uncertainties in global warming prediction by measuring the three dimensional structure of clouds and aerosols, which are most uncertain parameter in the numerical climate models.

Instrument

CPR (Cloud Profile Radar)
ATLID (Atmospheric LIDAR)
MSI (Multi-Spectral Imager)
BBR (Broad Band Radiometer)

- Joint Mission by Europe and Japan
- Launch in 2016
- 3 years lifetime
- 400 km altitude
- Sun-synchronous orbit (Local time: 14:00)

GOSAT: Greenhouse Gases Observing Satellite

Instruments:

TANSO = Thermal And Near infrared Sensor for carbon Observation

- Monitoring global distribution of Greenhouse Gases from space
- Observing Carbon dioxide and Methane at 100-1000km spatial scale with relative accuracy of 1% (4ppm) for CO2 and 2% (34ppb) for CH4
- Joint project with NIES and MOE
- Launch: 23 January, 2009 by H2A launch vehicle (Lifetime: 5 years)

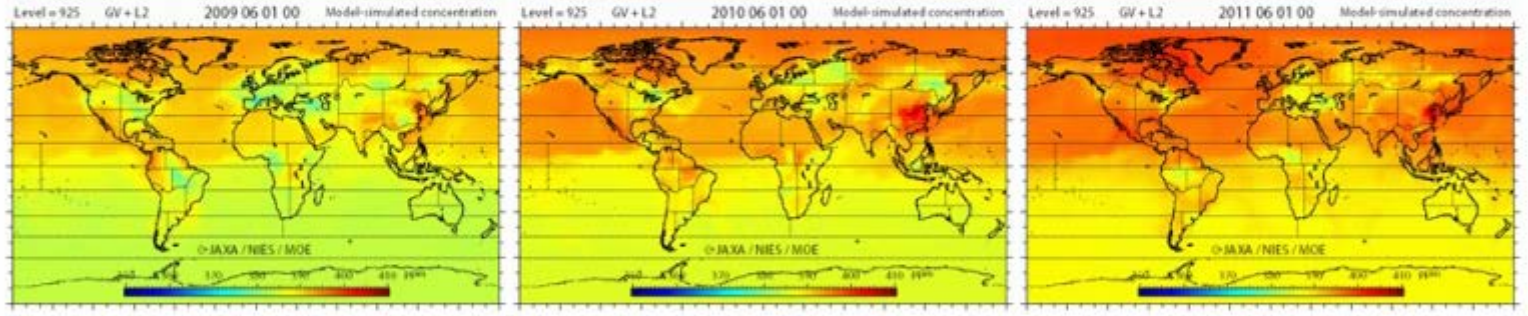
*NIES: National Institute for Environmental Studies
*MOE: Ministry of the Environment

Daily Mean of CO_2 Concentration

GOSAT L4B Data Product
Model-simulated concentration
(6hr-step, 0.925 sigma-level, 2.5° × 2.5° grid)

MM DD HH
06 01 00

2009.6~2010.5 2010.6~2011.5 2011.6~2011.10



350 360 370 380 390 400 410 ppm

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Thank you for your attention.
Have a fruitful Meeting !