

Project for Earth Environment Observation in NASDA

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Abstract

The overview of project for the earth environment observation mission in NASDA is introduced in the presentation.

The summary of Japanese Earth Observation Satellite Programs

- In operation: JERS-1(Earth Resources Satellite), GMS-5(Geostational Meteorological Satellite), ADEOS(Comprehensive Earth Observation)
- Under Phase C/D: TRMM(Rainfall Mission), ADEOS-II
- Under Phase B: ALOS(Land Observation)
- Under Phase A: ATMOS-A(Rainfall mission)
- Under Conceptual Study: ATMOS-B(Cloud and Radiation Mission), ATMOS-C (Atmospheric Mission), ADEOS-III

The summary Satellite Programs Status

- ADEOS was launched successfully on August 1996 and all onboard sensors /satellite are working well. ADEOS and ADEOS-II is jointly developed by NASDA, MITI, EA, NASA/JPL, CNES.
- TRMM is prepared for launch in autumn 1997. TRMM is a NASDA/NASA joint project.

Japanese Scenario of Long Term Earth Observation(Draft)

- Lidar MDS is considered as a precursor of ATMOS-B, Cloud and Radiation Mission in the scenario. For MDS, phase C budget in FY1997 is requested.
- NASDA had discussions on the international cooperation in the development of ATMOS-B with ESA and JPL.
- JEM/SS first AO is dedicated to domestic sensor providers.

Project for Earth Environment Observation in NASDA

International Workshop on Spaceborne Lidar 1996

Tamotsu Igarashi

December 16, 1996

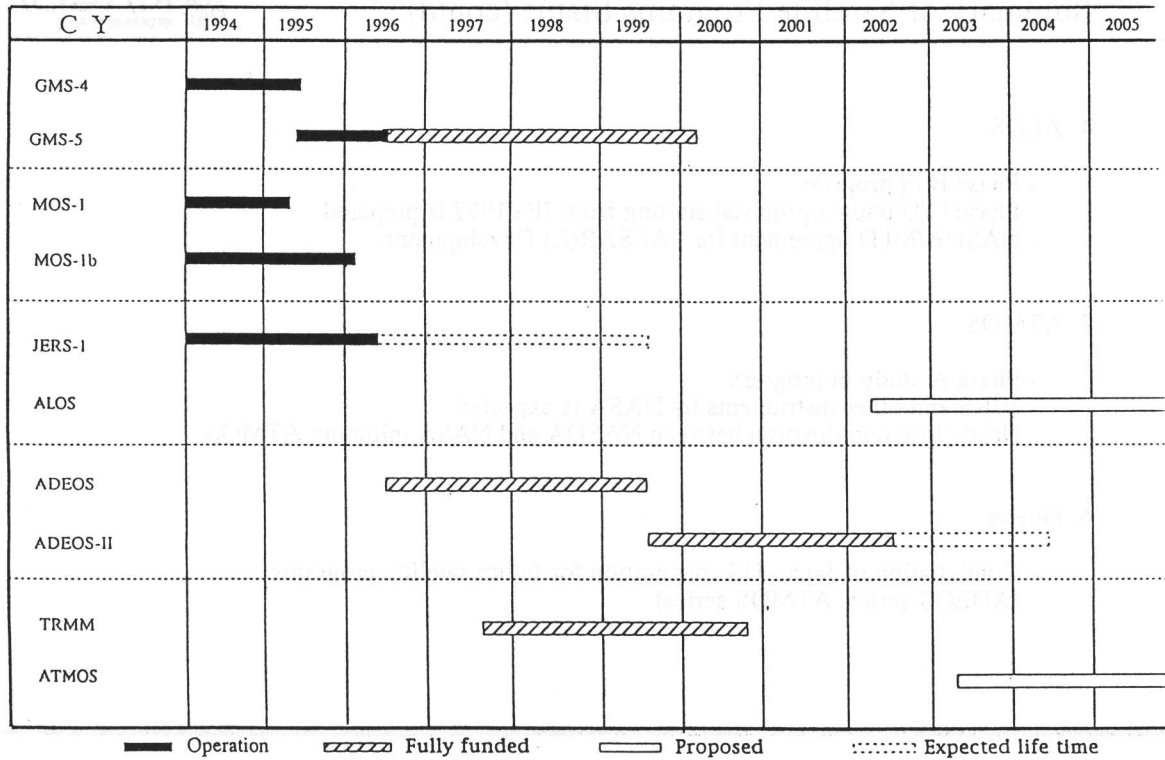
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Summary of Japanese Earth Observation Satellite Programs

<u>In operation</u>	<u>Launch</u>	<u>Instruments</u>	<u>Remarks</u>
JERS-1	2/1992	SAR(L), OPS	Land Obs.
GMS-5	3/1995	VISSR	Metorological Service
ADEOS	8/1996	OCTS, AVNIR, IMG ILAS, RIS, NSCAT TOMS, POLDER	Polar Platform Environmental Obs. Operational from Nov. 1996
* Under Phase C/D (Fully Funded)			
TRMM	1997	PR, TMI, VRIS, CERES, LIS	U.S./Japan joint program
ADEOS-2	1999	AMSR, GLI, SeaWinds, ILAS-II, POLDER, DCS	ADEOS F/O
MTSAT	1999	Imager	Meeteorological Service
* Under Phase B			
ALOS	2002	PALSAR(L), AVNIR-2, PRISM	Land Obs. High Resolution
* Under Phase A			
ATMOS	2003	PR, AMSR, VIRS (CERES, LIS)	TRMM F/O

EARTH OBSERVATION SATELLITE PROGRAM / NASDA

August, 1996



Summary of Satellite Programs Status



1. ADEOS

- Flight Readiness Review was completed on Aug. 12, 1996
- ~~Scheduled for~~ launch on Aug. 17, 1996
- **Operational ed**

2. TRMM

- PR was delivered to NASA
- TRMM launch schedule/November 1997 was coordinated.

3. ADEOS-II

- Phase C/D in Progress
- Half year delay of launch target proposed to SAC and approved. (New Target Date: August 1999)
- MOU between NASDA and NASA/NOAA being coordinated.

Summary of Satellite Programs Status (contd)



4. ALOS

- Phase B in progress
- Phase C/D budget proposal starting from JFY1997 is prepared.
- NASDA/MITI agreement for PALSAR(L) Development.

5. ATMOS

- Phase A study in progress
- VIRS and other instruments by NASA is expected.
- Need close coordination between NASDA and NASA initiating ATMOS

6. Others

- Continuation of Japan-US cooperation for future satellite programs (ADEOS series, ATMOS series)

NASDA Instruments for NASA/EOS



1. AMSR for EOS-PM1

- Phase-A budget approved in FY1996
- Phase-C/D budget starting JFY1997 is prepared
- Letter exchange between NASDA and NASA for technical information exchange

2. ODUS for EOS-Chem

- Phase-A budget approved in JFY1996
- Phase-A budget will be continued in JFY1997
- Good working relationship between NASDA and NASA/GSFC
- Waiting for NASA's result of EOS-Chem options study

1. IGOS (Integrated Global Observing Strategy)

- NASDA welcomes US initiative for IGOS
- NASDA participated in IGOS/CEOS meeting in Seattle, March 1996.
- NASDA will participate in IGOS/IN-situ meeting in September, Geneva.

2. Earth Observation Information Networks

- Japan-US cooperation for GOIN, G7 ENRM and so on.
 - EOIS/NASDA-EOSDIS/NASA, NASDA-NOAA Data Networks, WGISS/CEOS activities and so on are in progress.
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3. Cooperation for Earth Science

- NASDA established EORC(Earth Observation Research Center) in 1995.
 - NASDA-NASA Joint Science Activities for satellite programs (TRMM, ADEOS-I/II,...)
 - Japan-US joint science workshops (1st US-Japan Earth Remote Sensing Conference, Hawaii University in April 1996, and others)
 - Japan-US joint effort to initiate International Research Centers;
 - At Alaska, Japan-US close coordination to establish new International Arctic Research Center (IARC) in progress
 - At Hawaii, preliminary discussions and feasibility study are on going.
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Japanese Scenario of Long Term Earth Observation(Draft)

NASDA/EOPD Oct.23,1995 @ Igarashi

CY Observation	1995		2000		2005		2010			
					Phase C/D		Phase B			
Global Observation (sun synchronous/ medium altitude) Large bus		96 Summer ADEOS	99 ADEOS-II	03 ADEOS-III	08 ADEOS-IV	13				
		OCTS AVNIR NSCAT	IMG ILAS TOMS POLDER	RIS TOMS POLDER	AMSR GLI POLDER	ILAS-II Sea-Winds POLDER	AMSR-2 GLI-2 IMG-2	ILAS-III Sea-Winds-II7 (DIAL) (ODUS-2)	ScaRaB TERSE A-POLDER (ODUS-2)	AMSR-3 GLI-3 (JLAWS) (CPR)
Regional Land Observation (sun synchronous/ medium altitude) Large bus				02 Winter ALOS	04 ALOS-A1	ALOS-A2				
				AVNIR-2 V-SAR	AVNIR-3 V-SAR	AVNIR-4 V-SAR		A/D makes a interferometry pair.		
					06 ALOS-B1	09 ALOS-B2	12			
					A-SAR L-ALT-G/ADALT	A-SAR L-ALT-G/ADALT				
Diurnal cycle Observation (low-high inclination/low- medium altitude) Medium- Large bus		97 Rainfall Observation Mission	TRMM PR TMI CERES VIRS LIS	03 Rainfall Observation Mission	ATMOS-A1 PR-2 AMSR-2 VIRS-2 CERES	ATMOS-A2 DPR	ATMOS-A3	Microwave Radiometer (Imager Sounder)		
					05 Cloud/Radiation Mission	ATMOS-B1 CPR (APS) ERBE L-ALT-1 IMG-2	ATMOS-B2 IMG-2 LIDAR	ATMOS-B3 Soil moisture-> L band Radiometer		
					06 Atmospheric Mission	ATMOS-C1 MILES or AMAS ODUS-2 ILAS-III	ATMOS-C2 HIRDLS JLAWS SSIM	ATMOS-C3		
						Solar radiance change/Wind/Temperature Monitor				
Geostationary Observation Large bus		Land/Ocean/Atmosphere Observation		05 cont. to ETS series	GEOS-I GOM GEOMER	10 GEOS-II				
					(ETS-N GLASS: Laser Long pass absorption)					
Experimental Observation Small bus		Mission resources 150kg 150W	LIDAR	MILES	ELMOS: Electro magnetic environment monitor					
JEM, Space shuttle (low inclination/low altitude)		JEM(Space Station)	CPR	DIAL	TERSE	MILES (JLAWS)		Water vapor sounder Vertical temperature profile		
		Shuttle		SMILES						
Airborne Experiment		PR POLDER	AMSR GLI LIDAR/LALT (CPR) L-SAR TERSE	DIAL				(NASA Airplane or sensors if available)		

Japanese sensor to foreign
satellites.
: ODUS->EOS/C1IEM(2002)
TERSE->EXPLORER

Foreign sensors to Japanese satellites
: AMAS(D) ->ATMOS-C1
: APS(Aw) ->ATMOS-B1
: CPR(US, GB) ->ATMOS-B1
: DPR(F) ->ATMOS-A2

: ScaRaB ->ADEOS-III
: ERBE ->ADEOS-III
: IASI ->ADEOS-III } One out of three