

ADEOS-II Platform Description

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Figure 1. ADEOS-II platform. Image courtesy of the Japan Aerospace Exploration Agency (JAXA)

1 PLATFORM OVERVIEW

The Advanced Earth Observing Satellite-II (ADEOS-II), also known as Midori-II, was launched on 14 December 2002. It follows the ADEOS mission, which ended June 1997. Design life of ADEOS-II was three to five years, but operations ended on 25 October 2003 because of insufficient electric power. ADEOS-II observes the distribution of chlorophyll, water vapor, sea water, sea surface temperature, and other variables related to the water, energy, and carbon cycles. Data will be used for the Global Energy and Water Cycle Experiment (GEWEX) Plan, the Climate Variation Research Plan (CLIVER) of the World Climate Research Programme (WCRP), and the International Geosphere-Biosphere Program (IGBP).

2 PLATFORM CHARACTERISTICS

- Main body dimensions: approximately 6 x 4 x 4 m
- Solar array paddle dimensions: approximately 3 x 24 m
- Mass: 3.68 tons
- Power: 5,350 W
- Design life: 3-5 years; operations ended prematurely on 25 October 2003.
- Launch vehicle: H-IIA rocket
- Launch site: Tanegashima Space Center

3 PLATFORM SENSORS

Instrument	Developer	Spectral Resolution	Geophysical parameters
Advanced Microwave Scanning Radiometer (AMSR)	Japan Aerospace Exploration Agency (JAXA)	8 bands from 6.9 GHz to 89 GHz	Water vapor, precipitation, sea surface wind speed, sea surface temperature, soil moisture, sea ice extent, snow water equivalent
Global Imager (GLI)	Japan Aerospace Exploration Agency (JAXA)	23 bands in visible and near-infrared region, 6 bands in short-wave infrared region, and 7 bands in middle- and thermal-infrared region	Reflected solar and infrared radiation, ocean color products, chlorophyll, organic substance, vegetation indices, sea surface temperature, snow and sea ice extent, snow grain size, snow impurities, snow surface temperature, aerosol optical thickness over snow surfaces, cloud distribution
Improved Limb Atmospheric Spectrometer-II (ILAS-II)	Ministry of the Environment (MOE)	3-13 μm , 753-784 nm	Stratospheric profiles of ozone, nitrogen dioxide, nitric acid, aerosols, water vapor, methane, CFC-11, CFC-12, nitrous oxide, and chlorine nitrate in polar regions; atmospheric temperature and pressure
Sea Winds	NASA Jet Propulsion Laboratory (JPL)	13.4 GHz	Ocean surface wind speed and direction
Polarization and Directionality of the Earth's Reflectances (POLDER)	Centre National d'Etudes Spatiales (CNES), France	A filter and polarizer wheel rotate and scan eight narrow spectral bands (564, 670, 763, 765, 865, and 910 nm) and three polarization angles (443, 670, and 865 nm).	Polarization; directional and spectral characteristics of solar light reflected by aerosols, clouds, oceans, and land surface

Also visit the ADEOS-II Orbital Parameters (JAXA) web page.

4 SOURCE OR PLATFORM MISSION OBJECTIVES

The primary science objective of the ADEOS-II mission is to use multiple sensors to study clouds, water vapor, soil moisture, snow runoff, snow and ice, oceanic plant and organic material, and other climatic factors that influence environmental change. Specific objectives are to:

- Understand the fixed quantity of the water-energy cycle in the climate system. The GLI sensor measures cloud variables and aerosols. AMSR estimates hydrology variables such as water vapor, precipitation, and soil moisture. Sea Winds estimates ocean stress, POLDER estimates aerosols, and ILAS-II estimates ozone and vertical distribution of gaseous components in polar atmospheres.
- Estimate the quantity of biomass and primary production in relation to the carbon cycle.
- Detect signal changes in long-term climate.

5 SOURCE OR PLATFORM PROGRAM MANAGEMENT

The ADEOS-II Mission Operation System (MOS), located at the Earth Observation Center (EOC) in Hatoyama, Japan, is the main planning organization for mission operations. The MOS plans the operation of ADEOS-II onboard instruments based on operation requests from sensor providers, schedules data downlinks, and plans tape-management operations.

6 COVERAGE INFORMATION

ADEOS-II flies in a sun-synchronous, subrecurrent orbit.

6.1 Attitude Characteristics

- Inclination: 98.62°
- Altitude: 802.92 km (perigee)
- Period: 101 minutes
- Recurrent period: 4 days
- Revolutions per day: 14.25

7 DATA COLLECTION SYSTEM

The EOC Real-Time Control System coordinates and optimizes conflicts between several satellites, including ADEOS-II, and assigns an available antenna to receive data from each satellite. The MOS receives the antenna information pertinent to ADEOS-II and schedules X-band stations to receive mission data from the satellite.

8 COMMUNICATION LINKS

The MOS serves as a Feeder Link Station for the Data Relay and Tracking Satellite (DRTS) and as a Direct Downlink Station for X-band direct transmission. The Kiruna (Sweden), Wallops (USA), and Alaska (USA) stations also receive mission data from ADEOS-II via X-band transmission, process into Level-0 data (except for POLDER and GLI 250 m), and transmit the Level-0 data to

the MOS in Japan. The Showa receiving station in Antarctica receives GLI 250 m data from ADEOS-II via X-band transmission, and delivers data via tape once per year to the MOS.

9 ATA ACQUISITION AND PROCESSING

The MOS processes mission data from ADEOS-II into Level-0 data and sends this to sensor developers via network communication or physical media. AMSR and GLI Level-0 data are processed into Level-1, -2, and -3 products.

10 DATA ACCESS

For access to AMSR data from the ADEOS-II platform, please see the AMSR/ADEOS-II Data web site.

11 LATITUDE CROSSING TIMES

ADEOS-II crosses the equator at 10:30 a.m. local time (± 15 minutes) in a descending node.

12 LIST OF ACRONYMS

The following acronyms are used in this document:

ADEOS-II	Advanced Earth Observing Satellite-II
AMSR	Advanced Microwave Scanning Radiometer
CLIVER	Climate Variation Research Plan
CNES	Centre National d'Etudes Spatiales
DAAC	Distributed Active Archive Center
DRTS	Data Relay and Tracking Satellite
EOC	Earth Observation Center (Japan)
EORC	Earth Observation Research and Application Center (Japan)
GEWEX	Global Energy and Water Cycle Experiment
GLI	Global Imager
IGBP	International Geosphere-Biosphere Program
ILAS-II	Improved Limb Atmospheric Spectrometer-II
JAXA	Japan Aerospace Exploration Agency
JPL	Jet Propulsion Laboratory
MOE	Ministry of the Environment
MOS	Mission Operation System

POLDER	Polarization and Directionality of the Earth's Reflectances
WCRP	World Climate Research Programme

13 REFERENCES

Earth Observation Research and Application Center (EORC). *ADEOS-II Science Project*. 2003

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