

Status of The Current JAXA Earth Observation Missions

This document reports on the status of TRMM, AMSR-E and ADEOS-II (Midori-II).

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1. Introduction

Japan Aerospace Exploration Agency (JAXA) is currently running a number of earth observation programs. Tropical Rainfall Measuring Mission (TRMM), launched in November 1997, continues the observation extending its mission life. Advanced Microwave Scanning Radiometer (AMSR-E) onboard NASA's Aqua satellite, launched in May 2002, is in routine operation. Advanced Earth Observing Satellite-II (ADEOS-II) named Midori-II, was launched successfully in December 2002 and its routine operation was started in April 2003, however, its observation stopped unexpectedly on October 2003.

2. TRMM (Tropical Rainfall Measuring Mission)

The Tropical Rainfall Measuring Mission (TRMM) is a joint program between JAXA (former NASDA) and NASA. It is the first mission to carry precipitation radar to monitor tropical rainfall from Space. Over two-thirds of the world's rainfall occurs in tropical areas, and it is one of the main sources of global climate change.

JAXA provided the Precipitation Radar (PR) equipment for the satellite, while NASA provided the satellite bus and sensors other than PR. TRMM was launched in November 1997 by the H-II rocket. The satellite has proved to be very successful, acquiring data to compile the world's first three-dimensional precipitation structure, as well as on precipitation rates and distribution. The data is highly useful for monitoring the water cycle, as well as latent heat.

In August 2001, the altitude of satellite was raised from 350 km to 400km in order to extend its mission life beyond 2005. The extension of this very important mission will contribute greatly to understanding of the water cycle and its impact on climate change.

3. AMSR-E (Advanced Microwave Scanning Radiometers for EOS)

AMSR-E is a microwave scanning radiometer, a modified version of AMSR installed on ADEOS-II. NASA's Aqua satellite carrying AMSR-E was successfully launched in May 2002. It is expected to improve the accuracy of modeling and forecasting of rainfall, typhoons and other climate changes.

The antenna of AMSR-E has the largest-diameter microwave scanning radiometer (about 1.6 meters), and it can collect water data with an unprecedentedly high definition. AMSR-E uses microwaves instead of optical sensors, and thus can continue observation

day and night, regardless of the weather, and without being interrupted by clouds. AMSR-E has demonstrated the usefulness and viability of microwave-based observation of the Earth's land and sea-surface.

4. ADEOS-II (Advanced Earth Observing Satellite-II)

ADEOS-II was launched by the H-IIA Launch Vehicle Flight No.4 on December 14, 2002. ADEOS-II was placed into the planned orbit successfully and named "Midori-II".

The objective of ADEOS-II, as a successor to the Advanced Earth Observing Satellite (ADEOS) launched in August 1996, was to acquire data to contribute to international global climate change research, as well as for applications such as meteorology and fishery.

It carried five sensors. These are the Global Imager (GLI) and the Advanced Microwave Scanning Radiometer (AMSR), both developed by JAXA (NASDA), and instrumentation developed by other overseas and domestic organizations: SeaWinds, a scatterometer (NASA/JPL); ILAS-II, an improved spectrometer for measuring infrared radiation at the limb of the atmosphere (Environmental Agency), and POLDER, an Earth surface reflection measuring device (CNES).

After launch, initial check out of ADEOS-II was performed during four months, and then ADEOS-II routine operation was started in April 2003. However, its observation stopped on October 25, 2003(JST), because sufficient electric power was not available to maintain operation of the satellite.

5. References

Further information about the various JAXA earth observation missions can be found on the following URLs which offers the possibility to download many supporting relevant documentation:

http://www.jaxa.jp/missions/projects/sat/eos/trmm/index_e.html

http://www.jaxa.jp/missions/projects/sat/eos/aqua/index_e.html

http://www.jaxa.jp/missions/projects/sat/eos/adeos2/index_e.html