

INTRODUCTION TO ASTER GDS

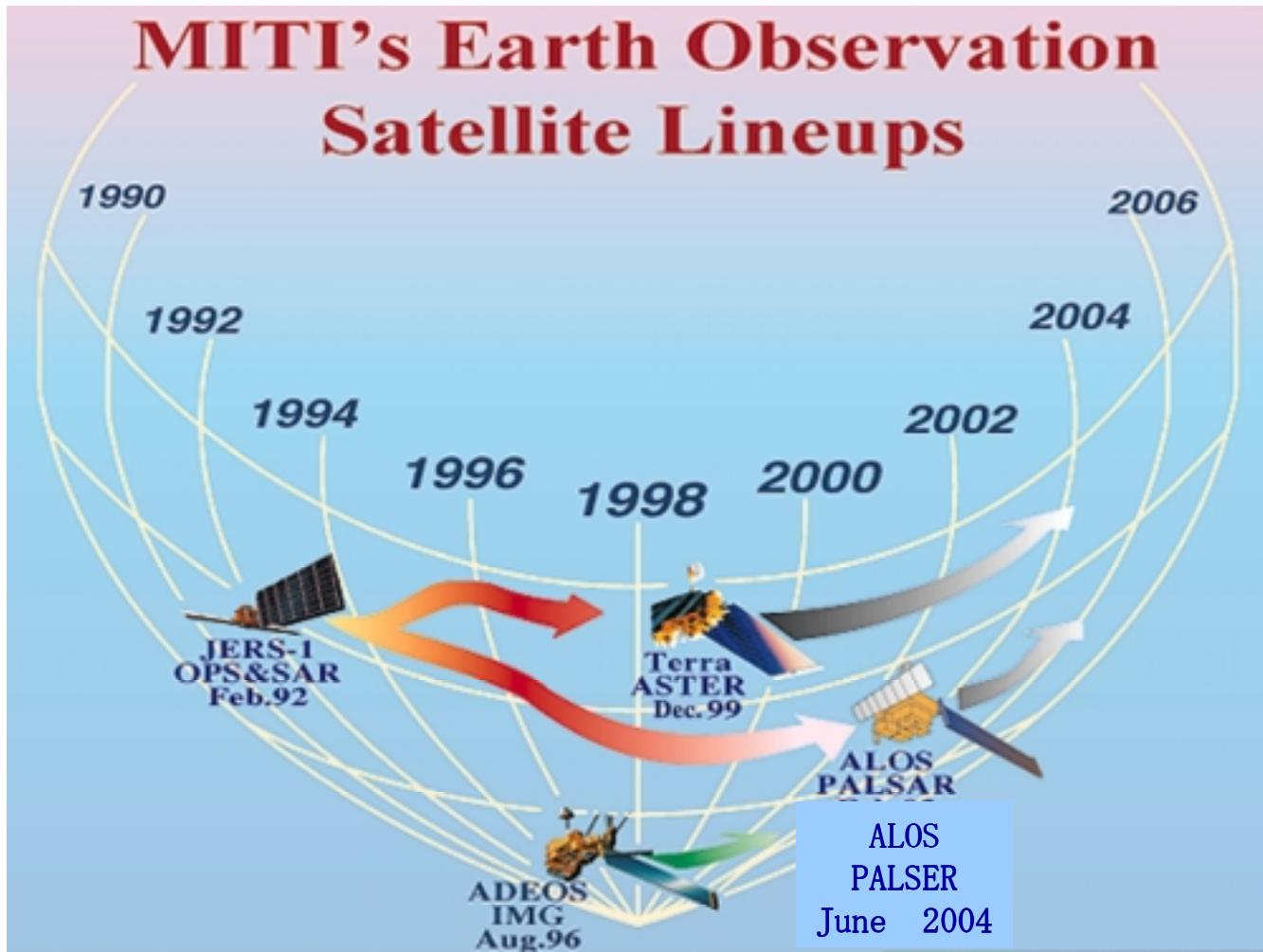
July 23, 2003
ASTER Work Shop
for NIK Insaat Ticaret Ltd. Sti.

Hiroshi Watanabe
ASTER GDS Project Manager
ERSDAC

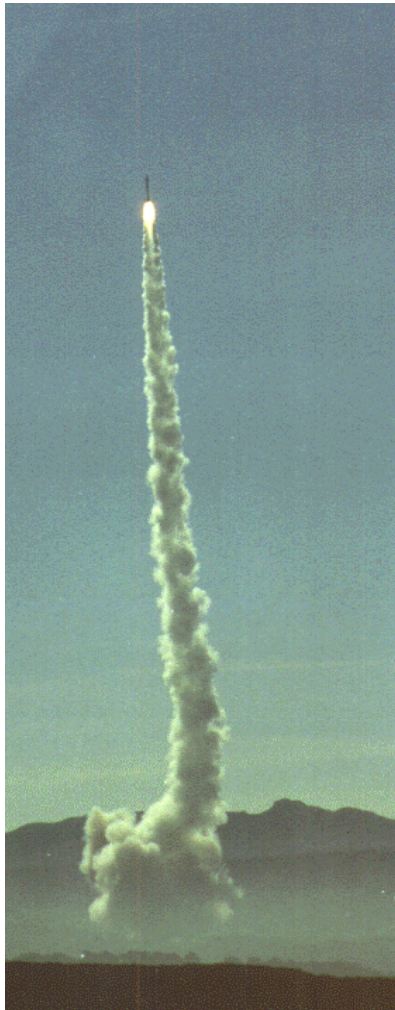
1. Introduction of ASTER GDS at ERSDAC Tokyo, Japan

METI's Earth Observation Satellite Lineups

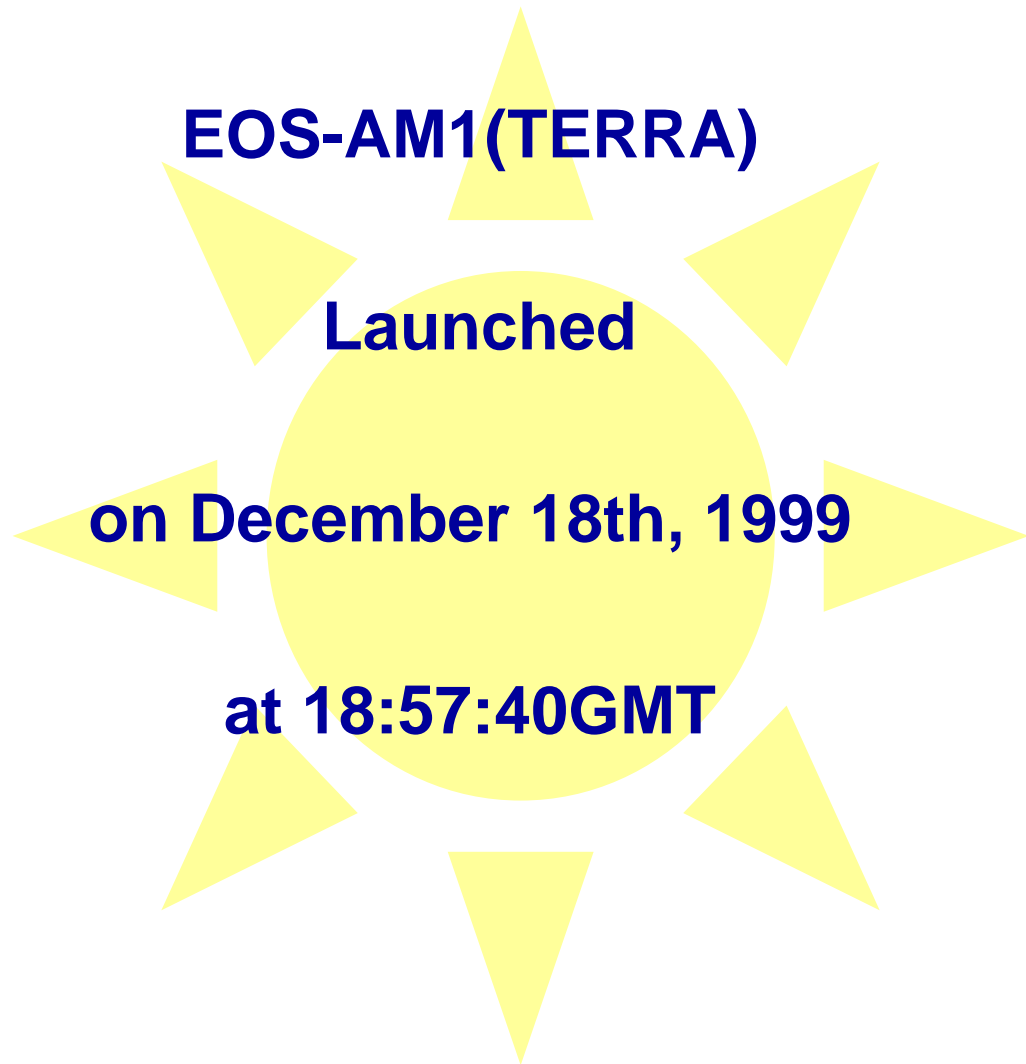
ASTER



July 23, 2003
ASTER Work Shop

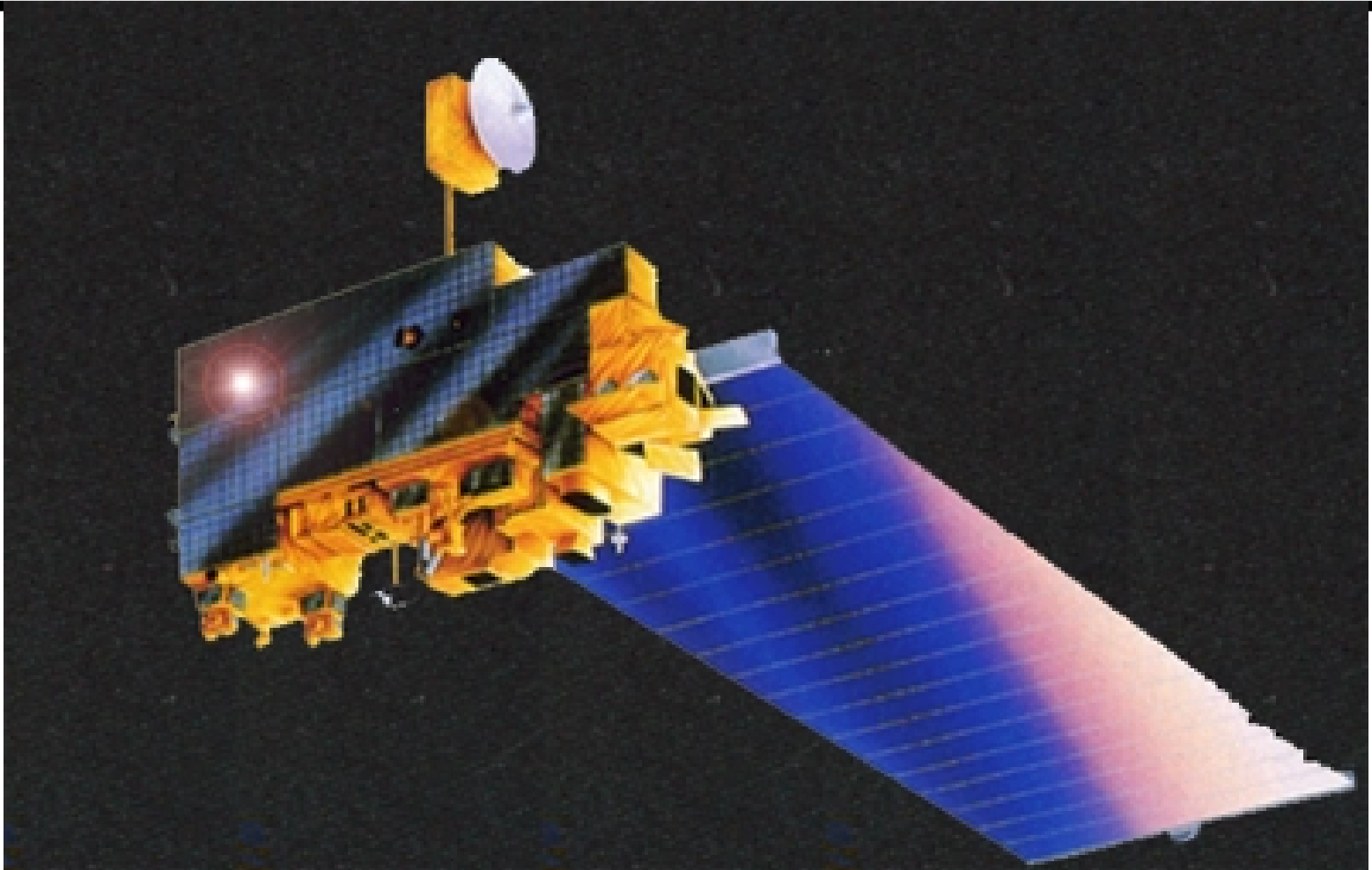


July 23, 2003
ASTER Work Shop



What is Terra ?

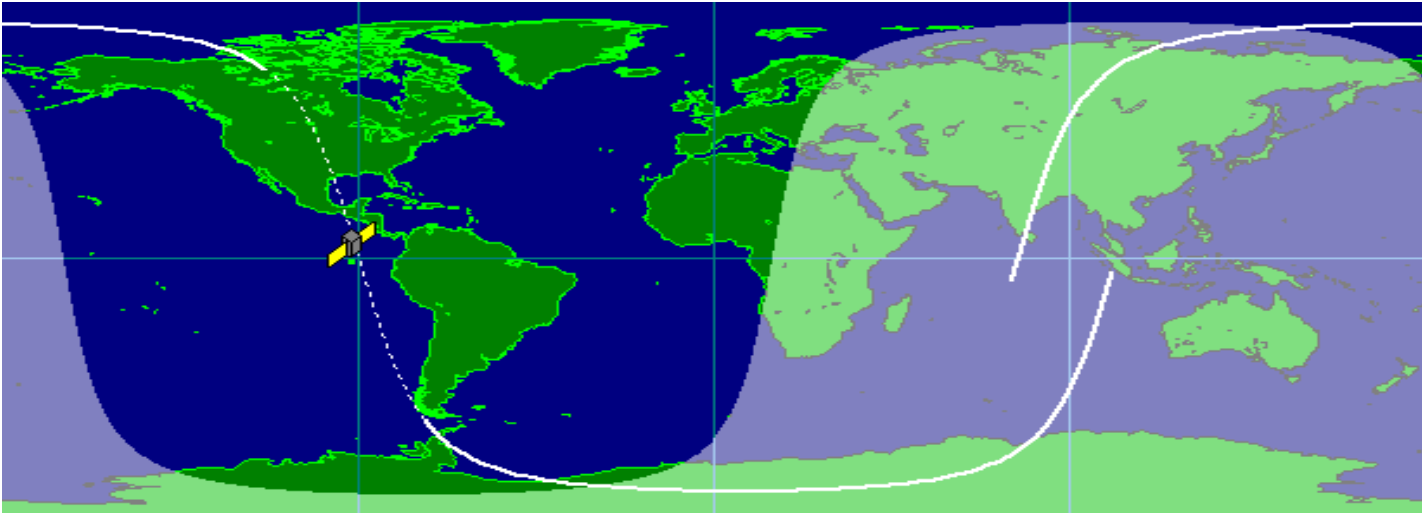
ASTER



July 23, 2003
ASTER Work Shop

Orbit of Terra

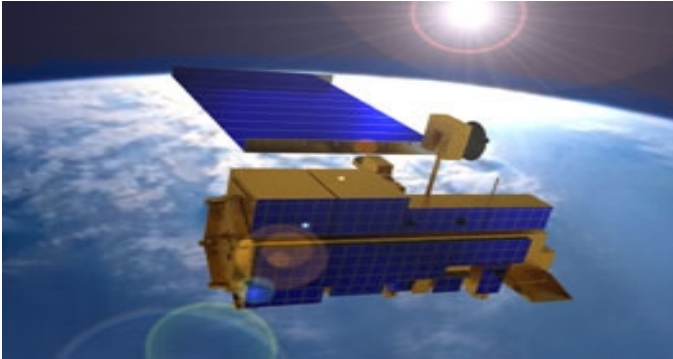
Orbit	Sun Synchronous
Local time at equator	10:30 a.m. ± 15min.
Altitude range	700-737 km (705 km at equator)
Inclination	$98.2^\circ \pm 0.15^\circ$
	16 days (233 revolutions/16 days)
Distance between adjacent orbits	172 km at equator
Repetition accuracy	± 20 km, 3σ



Terra Orbital Elements

ASTER

Local time at descending node	10:30 AM
Eccentricity	0.0012
Semi-major axis	7078km
Altitude	700-737km (707km at Equator)
Orbit Inclination	98.2
Recurrence Cycle	16 days
Distance between paths at Equator	172km
Cycle	98.88 minutes
Accuracy of Position Determination	150m(±)
Accuracy of recurrence	20km(±)
Period of mission	6 years
Sensors	ASTER, CERES, MISR, MODIS, MC



CORE SENSORS:

- ASTER

Advanced Spaceborne Thermal Emission & Reflection Radiometer

- CERES

Clouds and the Earth's Radiant Energy System

- MISR

Multi-angle Imaging Spectro-Radiometer

- MODIS

Moderate-resolution Imaging Spectroradiometer

- MOPITT

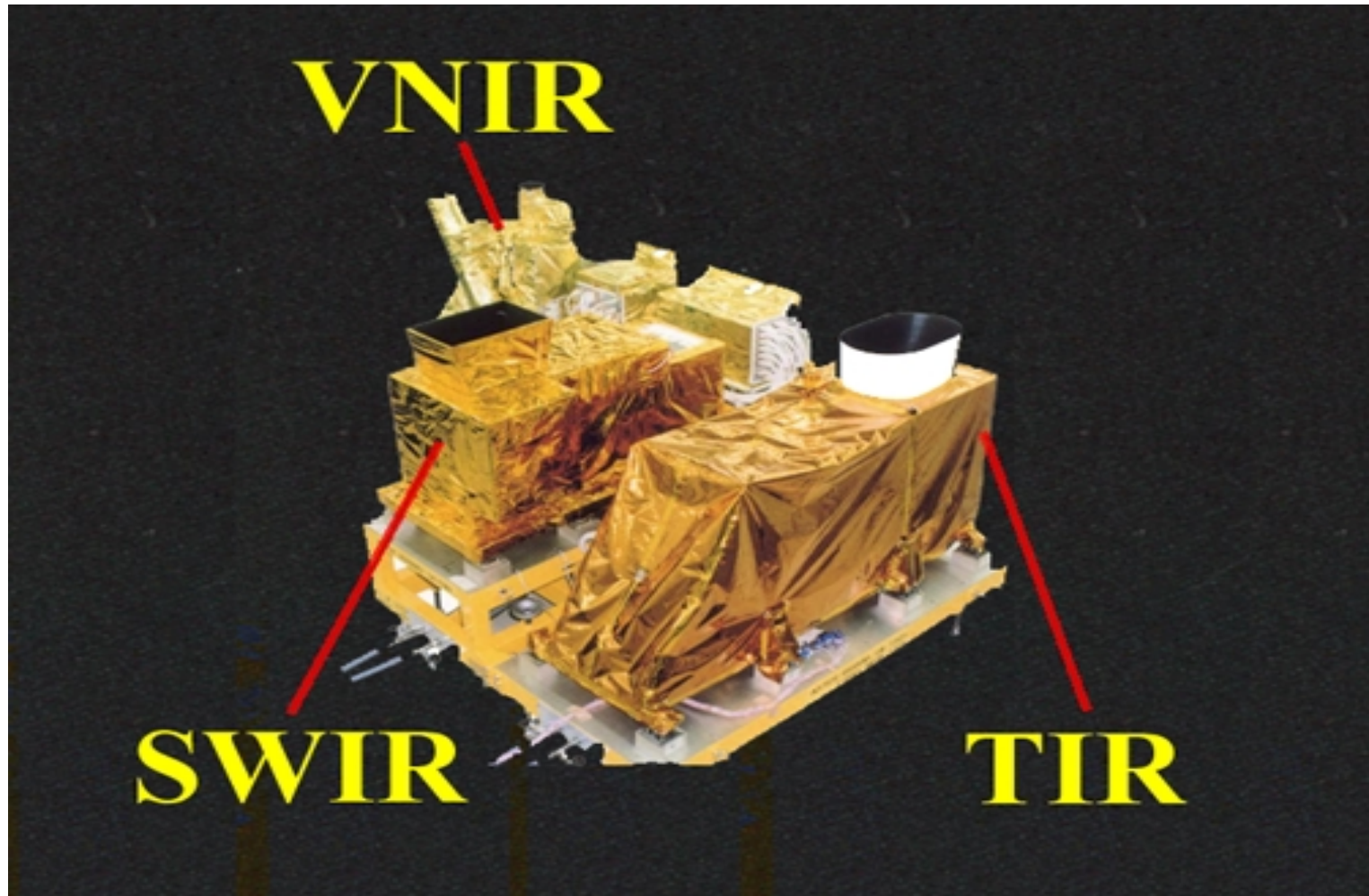
Measurements of Pollution in the Troposphere

PURPOSES:

- (1) To promote research into geological phenomena of tectonic surfaces and geological history through detailed mapping of the Earth's topography and geological formations. (This goal includes contributions to applied research in remote sensing.)
- (2) To understand distribution and changes of vegetation.
- (3) To further understand interactions between the Earth's surface and atmosphere by surface temperature mapping.
- (4) To evaluate impact of volcanic gas emission to the atmosphere through monitoring of volcanic activities.
- (5) To contribute to understanding of aerosol characteristics in the atmosphere and of cloud classification.
- (6) To contribute to understanding of the role coral reefs play in the carbon cycle through coral classification and global distribution mapping of corals.

What is ASTER ?

ASTER

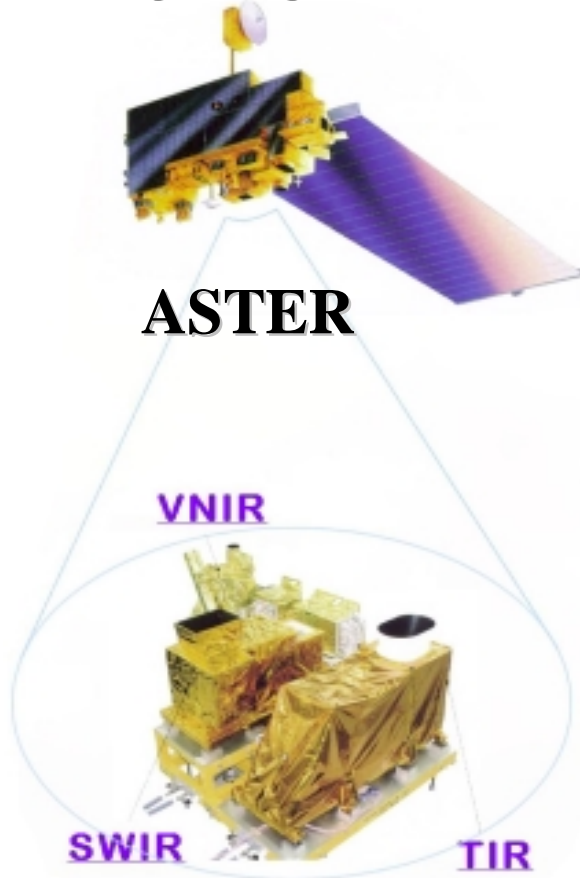


July 23, 2003
ASTER Work Shop

ASTER sensors

ASTER

Terra



VNIR



SWIR



TIR

VNIR

Visible Near Infrared Radiometer

Wave Length : **3 Bands + Backward**
0.52 - 0.86 μm

Spatial Resolution : **15 m**

Pointing Angle : **$\pm 24^\circ$**

(Cross-track Direction)

SWIR

Short Wave Infrared Radiometer

Wave Length : **6 Bands**
1.60 - 2.43 μm

Spatial Resolution : **30 m**

Pointing Angle : **$\pm 8.55^\circ$**

(Cross-track Direction)

TIR

Thermal Infrared Radiometer

Wave Length : **5 Bands**
8.125 - 11.65 μm

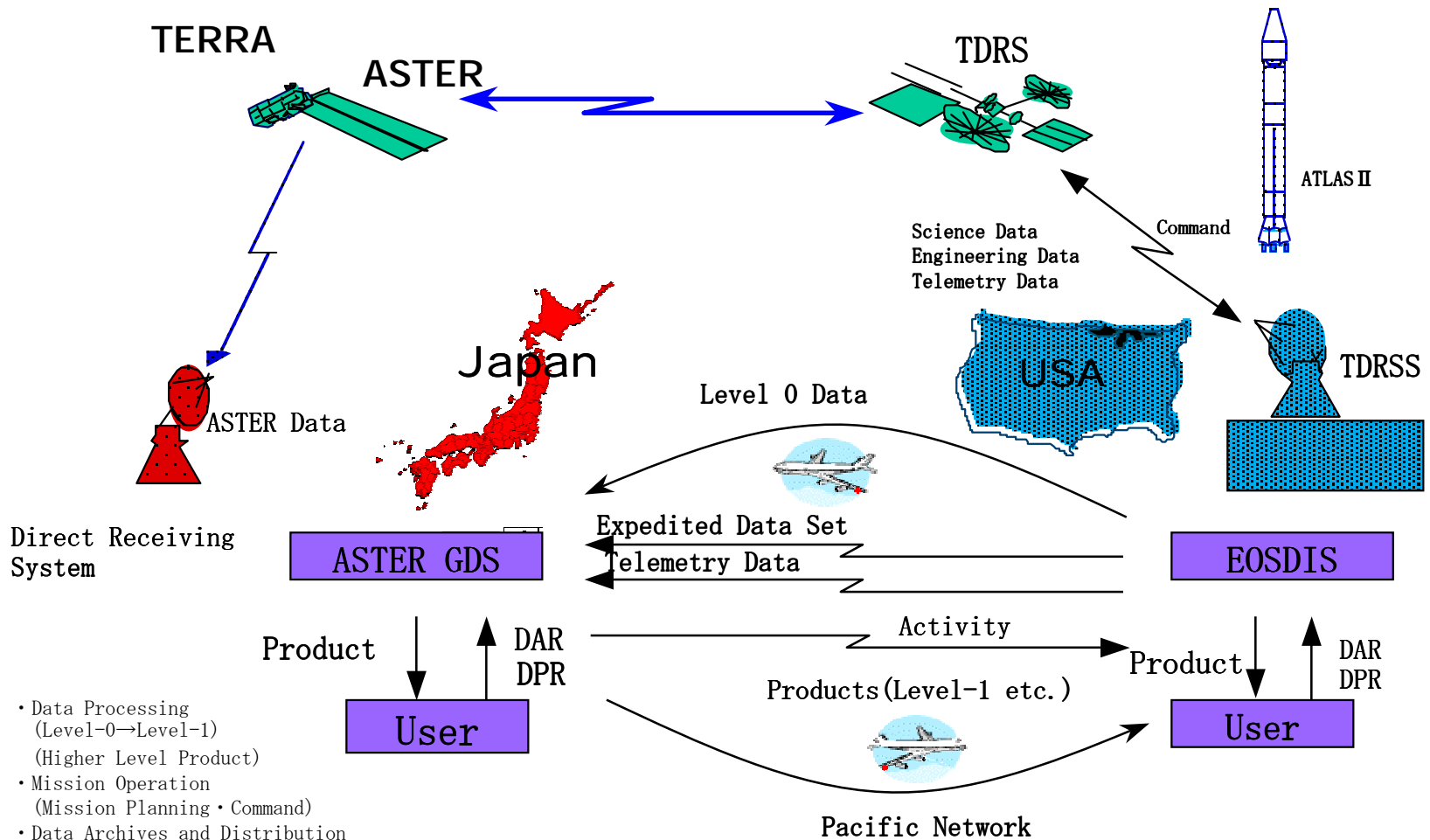
Spatial Resolution : **90 m**

Pointing Angle : **$\pm 8.55^\circ$**

(Cross-track Direction)

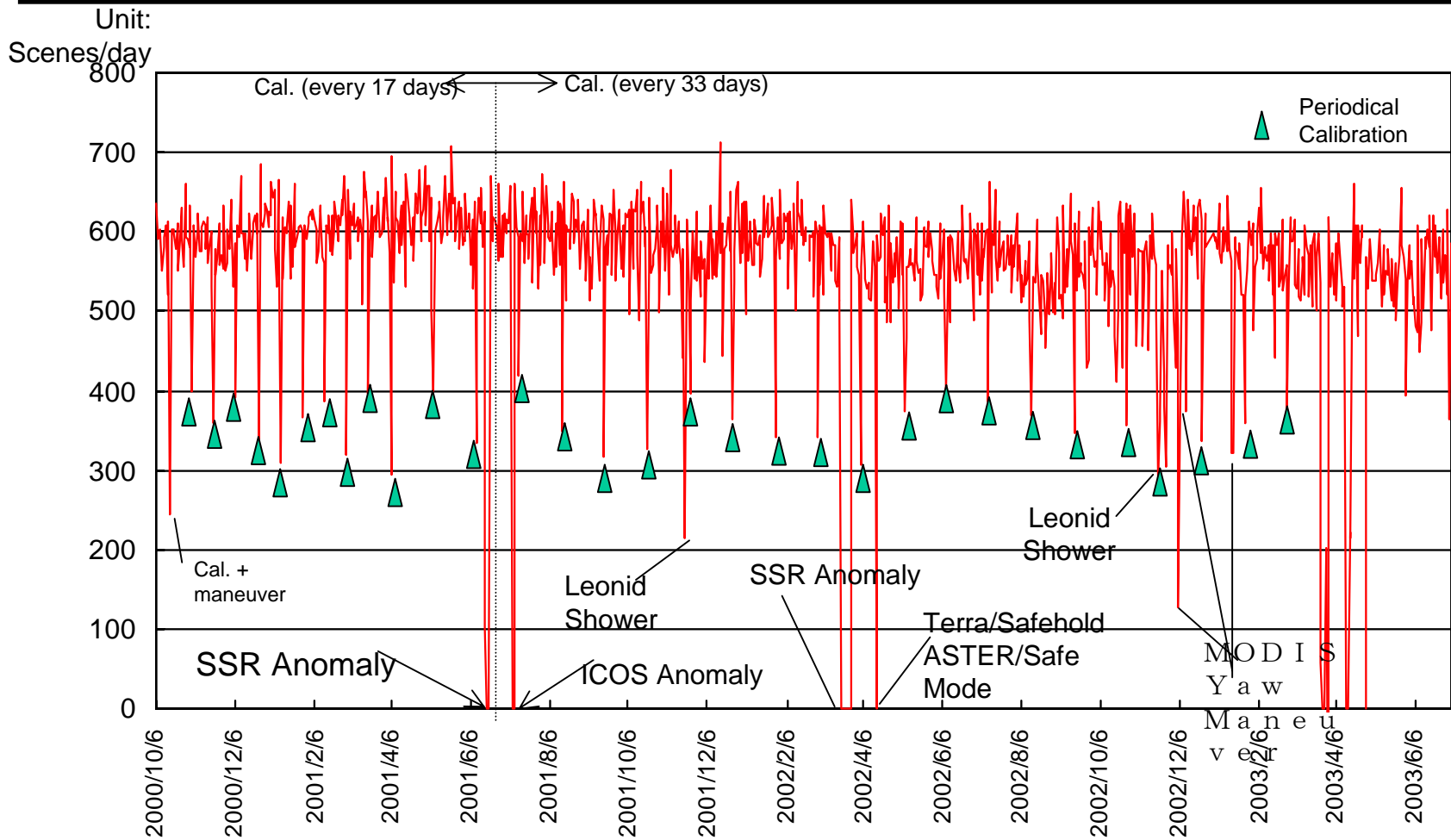
Data Flow and Relationship between JAPAN and USA

ASTER



- Data Processing (Level-0→Level-1) (Higher Level Product)
- Mission Operation (Mission Planning • Command)
- Data Archives and Distribution

Acquired Scenes

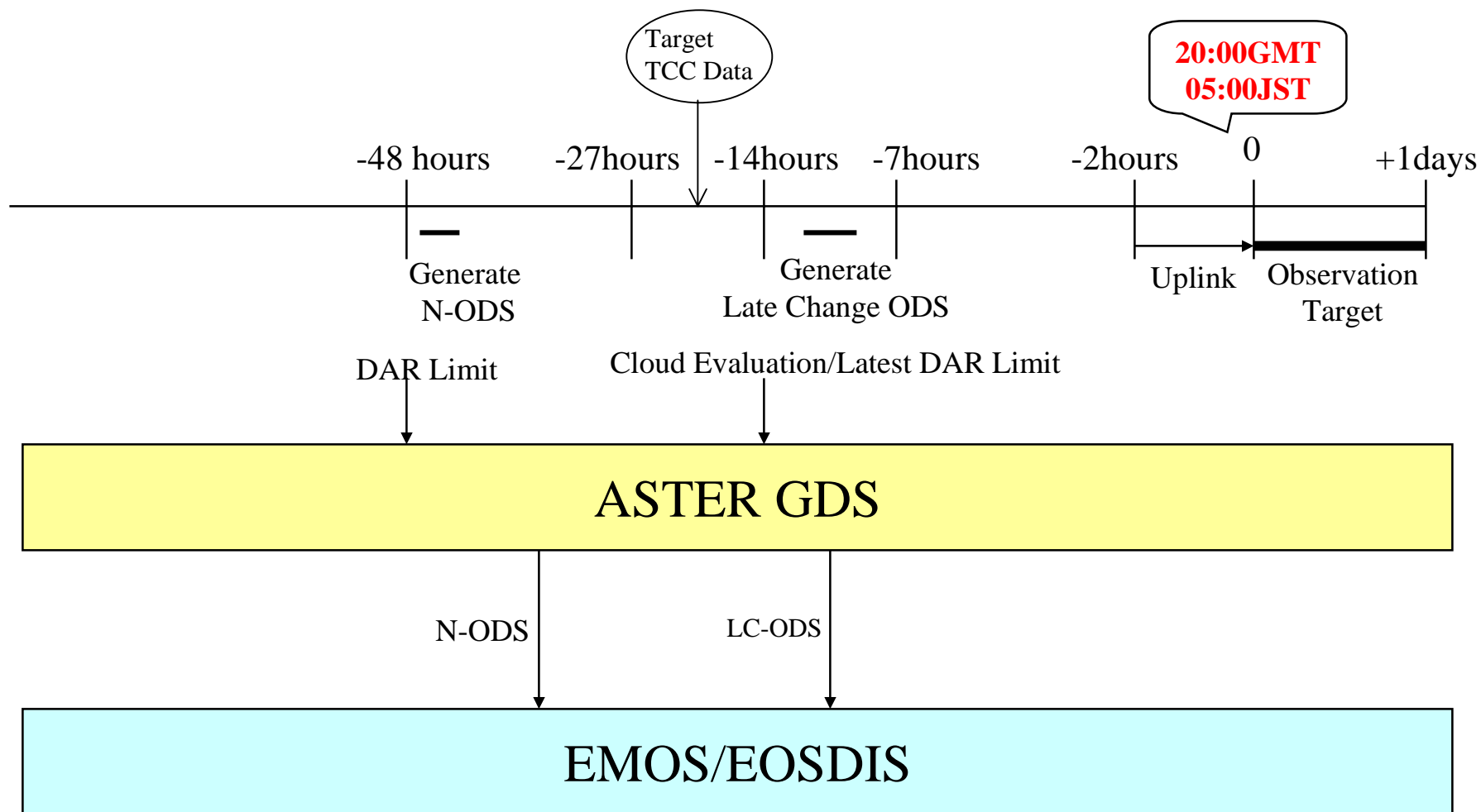


The total no. of acquired scenes from Feb. 28th, 2000, to July 11th, 2003 is **637,460**

LC Operation (1)

Timeline for Observation Schedule

ASTER



Effectiveness of Late Change-ODS Operation

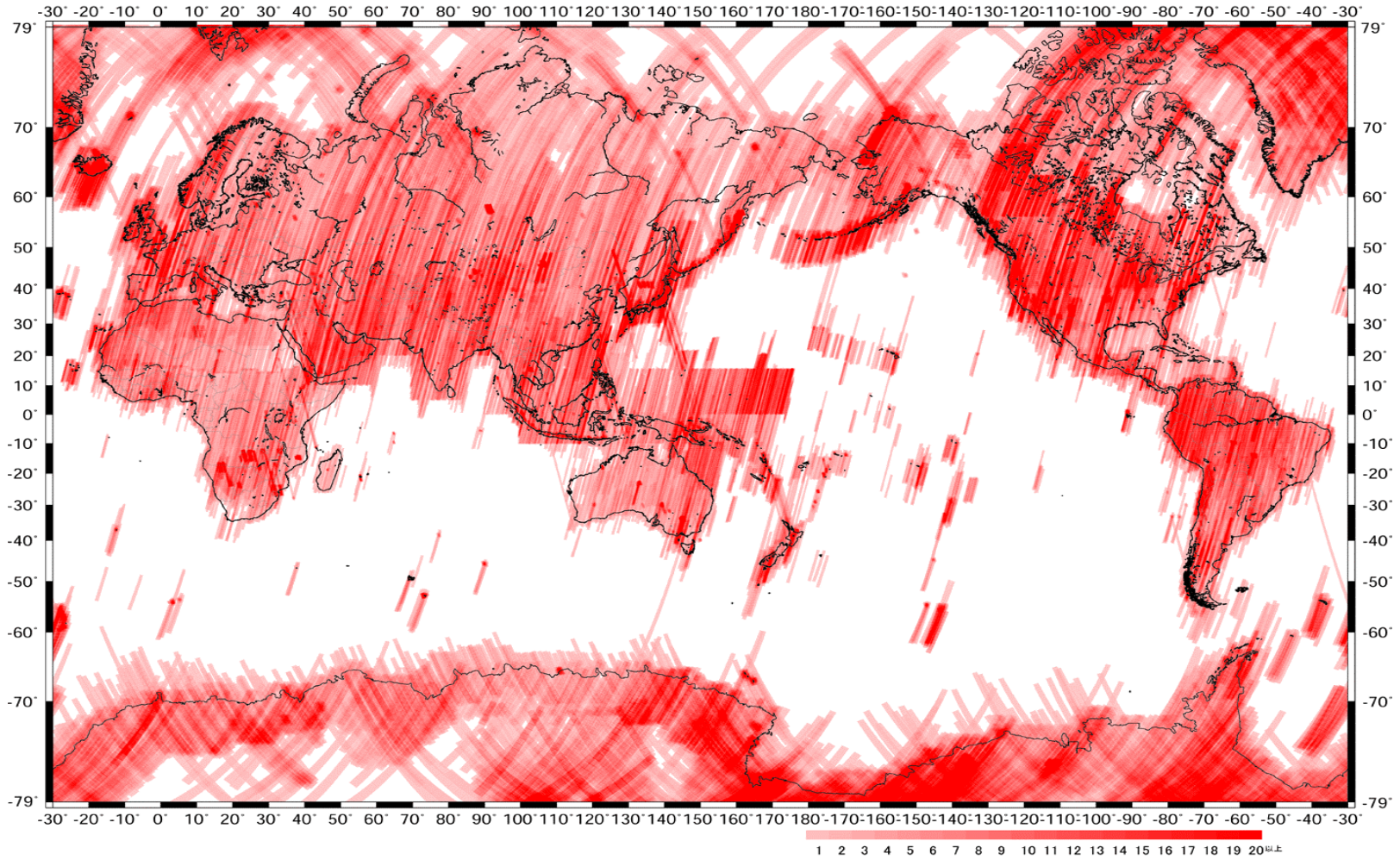


	No L/C		L/C		Checking Method
	Cloud Coverage	No. of Scenes	Cloud Coverage	No. of Scenes	
00/11-12	45.4%	2756	36.5%	3120	Visual Check
01/5-7	40.6%	5103	36.7%	5192	L1 Auto.
02/2-7	40.4%	19,288	35.0%	52,445	L1 Auto.

ASTER Observed Scenes: 579,477

Launch to 12 Mar. 2003

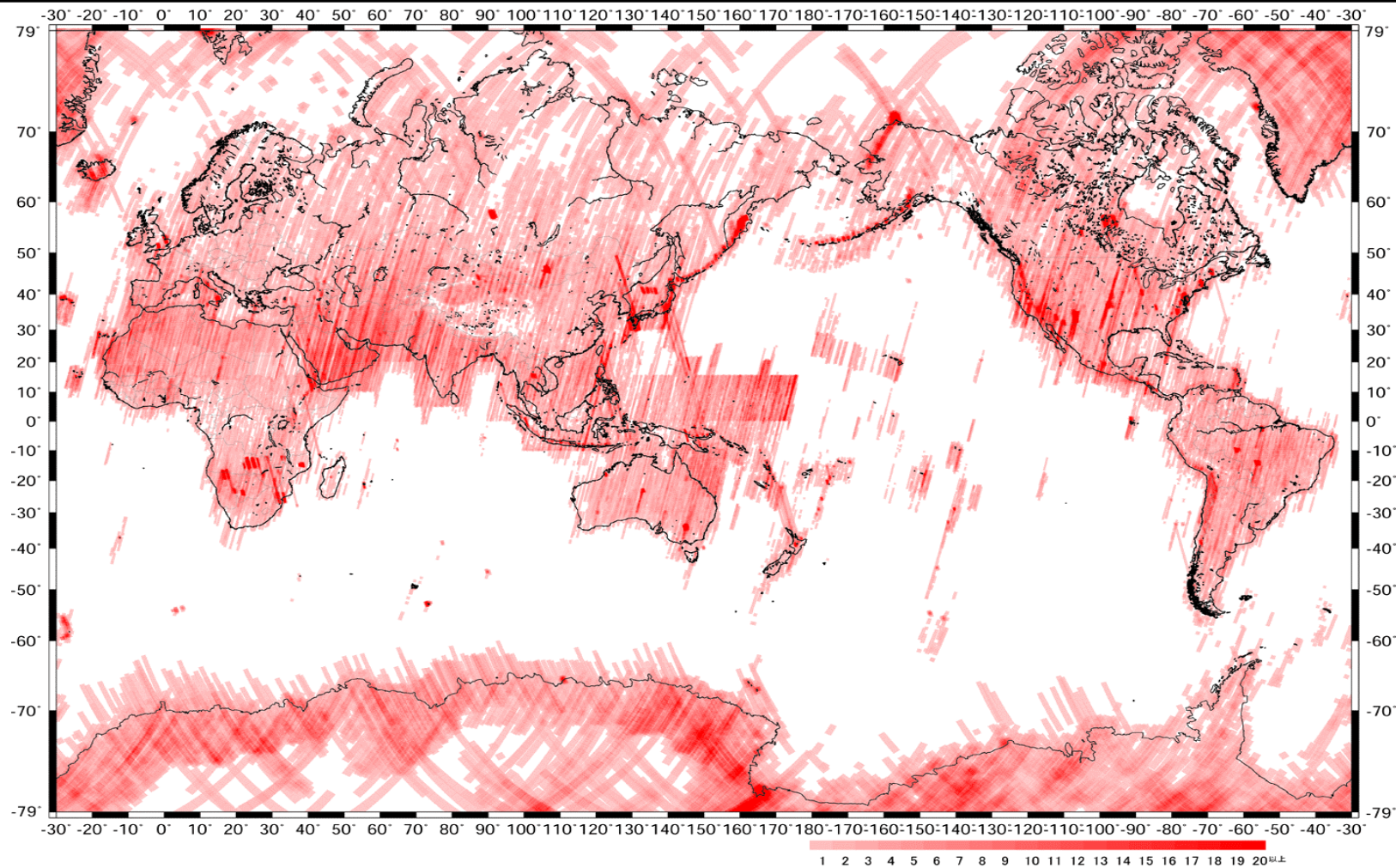
ASTER



Cloud Coverage Value 0 to 20% : 250,936

Launch to 12 Mar. 2003

ASTER

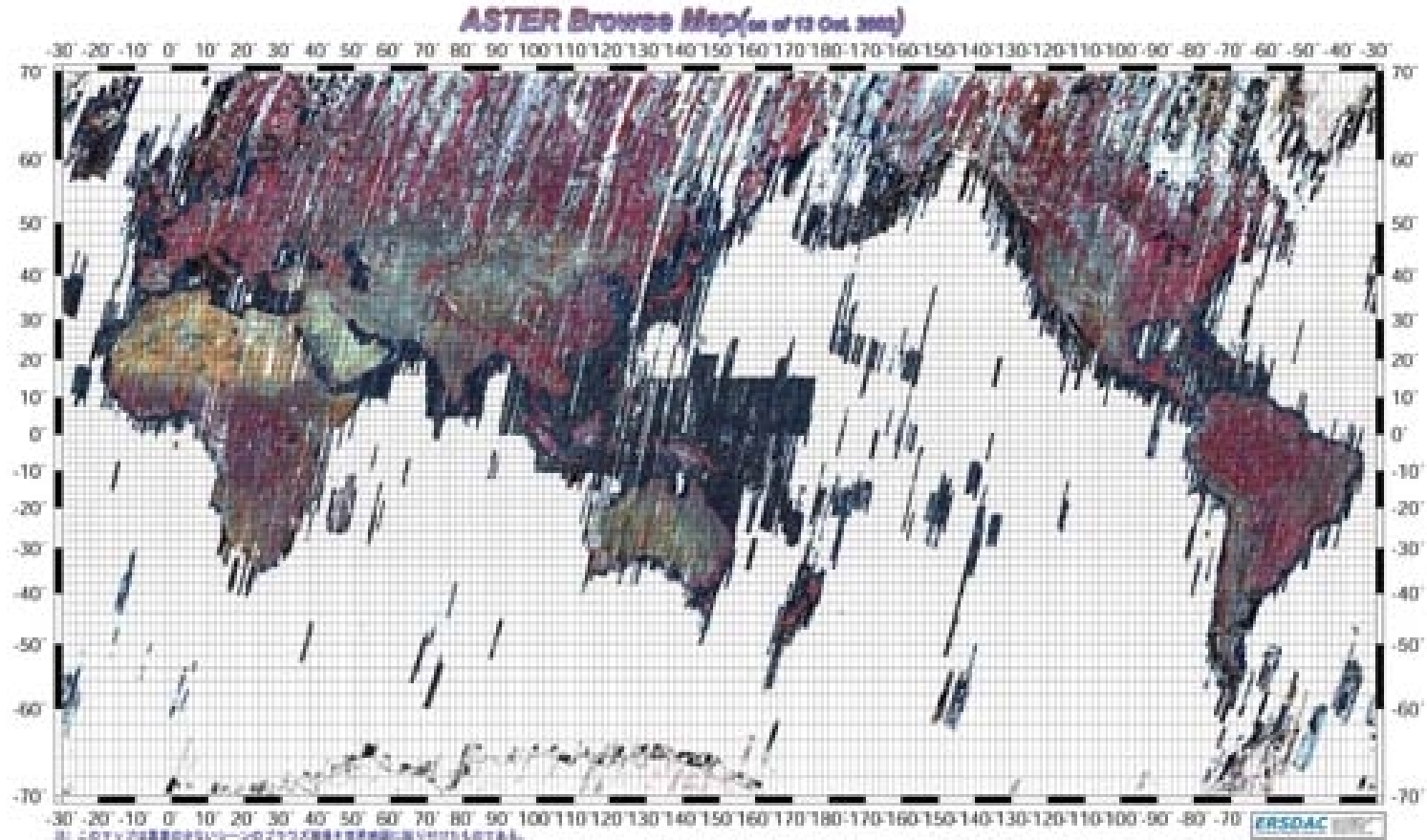


July 23, 2003
ASTER Work Shop

ASTER Data Coverage Map (5)

-WW Browse Map-

ASTER



July 23, 2003
ASTER Work Shop