Unique Potentiality of GOSAT
(Greenhouse Gas Observing Satellite)

October 23, 2006

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GHG Observing Points

Ground Stations (current)

- 274 ground stations in the world.
- The observing data from these stations is distributed from WDCGG of WMO
- The number of stations is limited, and they exist unevenly in the world.

From Space (GOSAT)

- Over 100,000 points per 3 days
- Global and frequent observation with an single instrument

WDCGG: World Data Center for Greenhouse Gases
WMO: World Meteorological Organization
GOSAT is the joint project of JAXA (Japan Aerospace Exploration Agency), MOE (Ministry of the Environment) and NIES (National Institute for Environmental Studies).

**Organization of GOSAT Project Promotion**

- **MOE**
  - Sensor development (Funding Support)
  - Data Policy

- **JAXA**
  - Sensor development
  - Satellite development
  - H-IIA launch
  - Satellite operation
  - Data acquisition
  - Calibration

- **NIES**
  - Algorithm development
  - Data use for science
  - Validation

**Prof. Gen Inoue**
(Sensor Development)

**Dr. Kay O’Hashi**
(Pipeline Application)
Image of GOSAT Observation

GOSAT

666 km

10 km diameter

Solar Radiation

Launched in 2008
The GOSAT Operation

- **GPS**
- **GPS receiver**
- **Star Tracker**
- **Pointing Mechanism**
- **Cross track**
- 5 cross track patterns: 1, 3, 5, 7, 9 points/cross track scan
- 88 – 800 km
- Satellite Direction (along track)

Satellite orbit of GOSAT.
The daytime active orbit is shown by white track.
Future Potential Monitoring Target Area by GOSAT

Burst place of Russian Natural Gas Pipeline Systems between 2000 and 2002
(Source: East European Gas Association, 2004)
1st Sensor Calibration Test
in Moomba, West Australia
February ~ March, 2007

CSIRO monitoring stations

Moomba to Adelaide Gas Pipeline
The concept of the natural gas pipeline leak detection system using GOSAT

Step-1: Pipeline leak observation
Step-2: Data transmission and analysis
Step-3: Ground exploration based on analysis results
Step-4: Mitigation & Improvement of problems

Spectrometer on GOSAT
- Polar Orbit (once 3 days)
- 10km Resolution
- Detectable Limit: 1.3tCH₄/day

Step-1
Step-2
Step-3
Step-4

Leak Location
Mitigation & Improvement
Reduction of Greenhouse Gases
Prevention of Explosion
Contact Information

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