COP22 Japan Side Event
"Efforts toward satellite data utilization for IPCC Guideline of GHG Inventories"
Japan Pavilion, Marrakesh, Morocco,
13:00-14:30, 14 November 2016

GOSAT and GOSAT-2 missions for successive GHG monitoring

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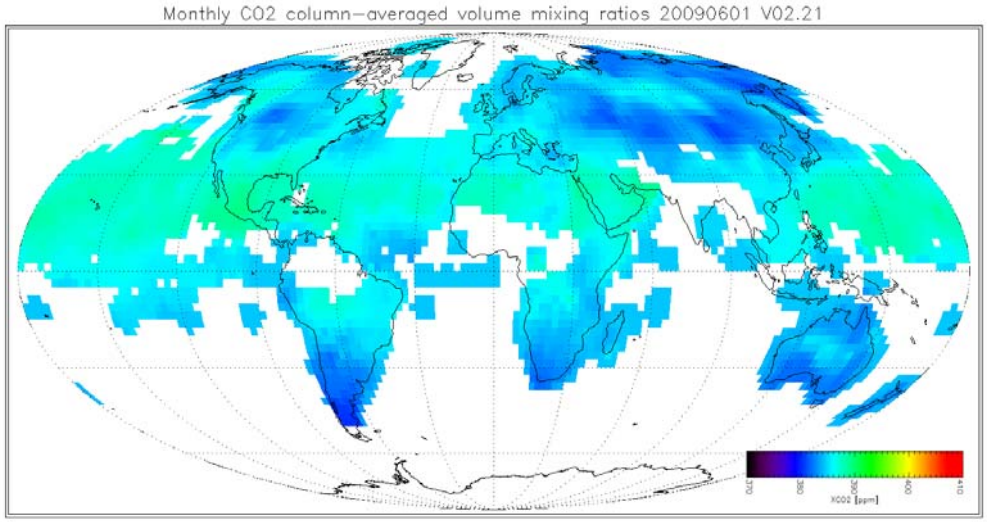
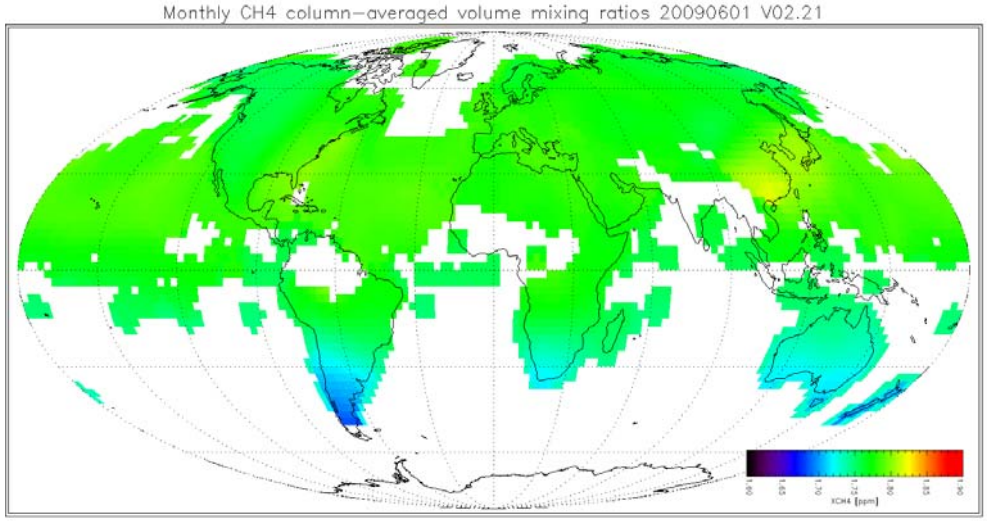
GOSAT CO_2 and CH_4 over 7.5 years

Monthly mean global CO_2 and CH_4 since 2009



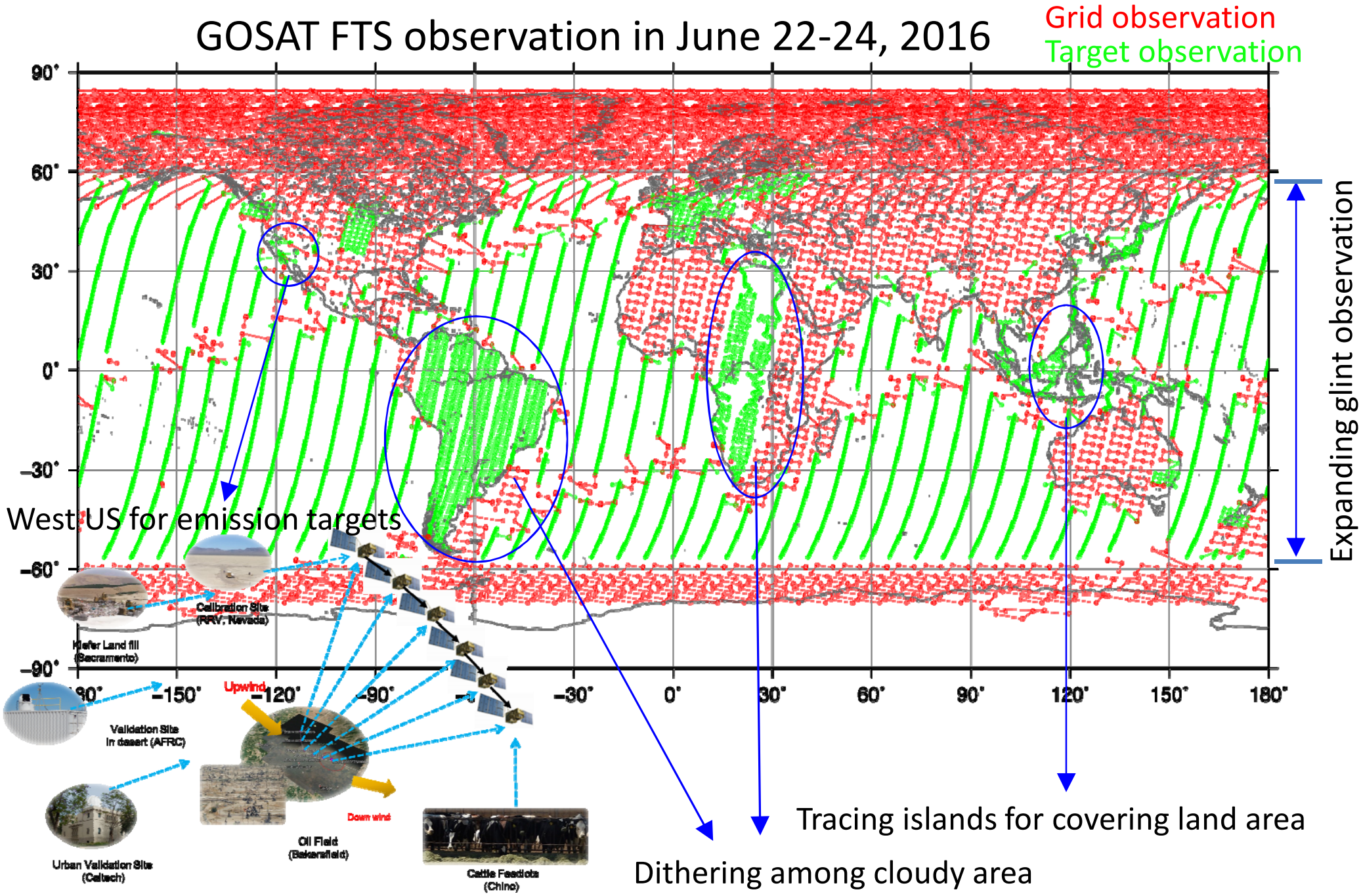
Global XCO_2 L3 map



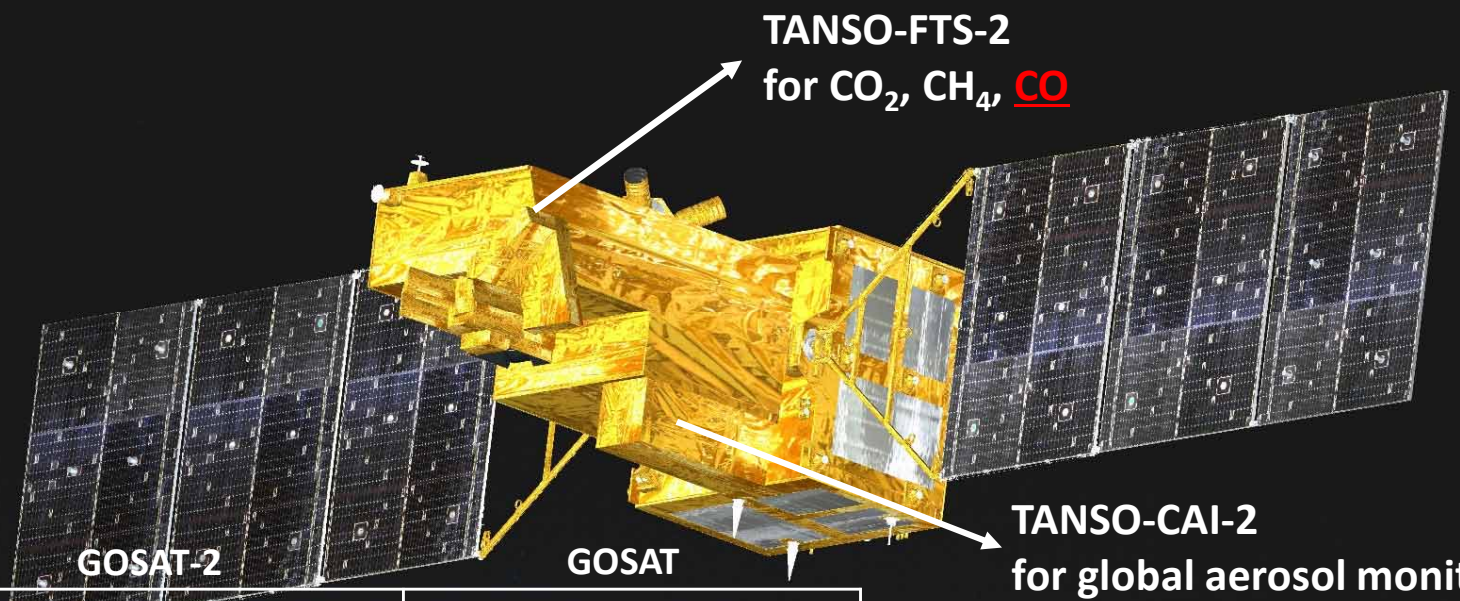
Global XCH_4 L3 map

The typical accuracy of retrieved column-averaged dry air mole fractions of CO_2 and CH_4 are 2ppm or 0.5% and 13ppb or 0.7%, respectively.

Optimization of observation points



GOSAT-2 specifications



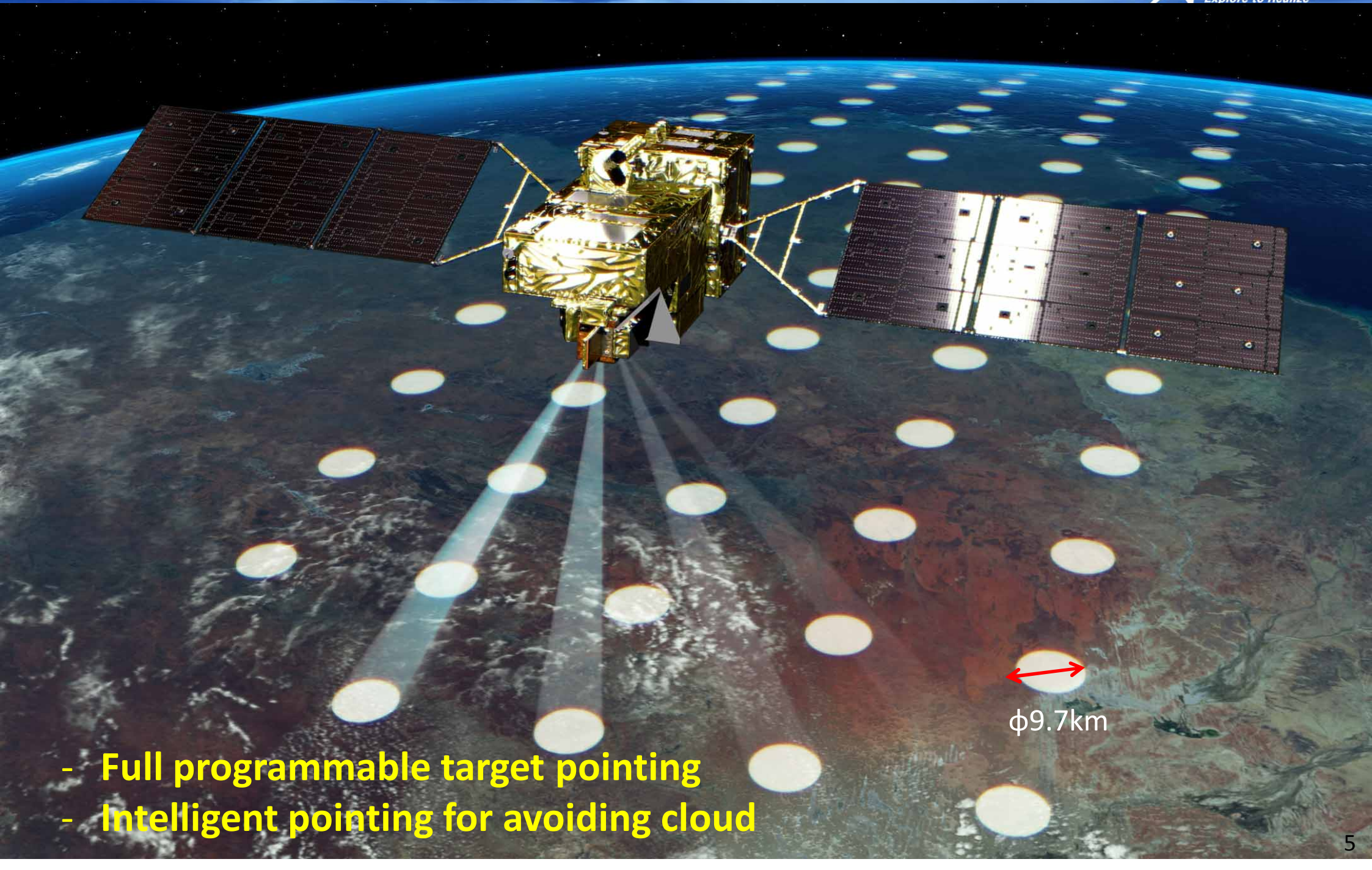
		GOSAT-2	GOSAT
Main body Size		5.3 m x 2.0 m x 2.1 m (Wing Span 16.5m)	3.7 m x 1.8 m x 2.0 m (Wing Span 13.7m)
Total Mass		1700kg	1750kg
Total Power		5.0 kW(EOL)	3.8 kW (EOL)
Life Time		5 years	5 years
Orbit		sun synchronous orbit	sun synchronous orbit
	Local time	13:00+/-0:15	13:00+/-0:15
	Altitude	613km	666km
	Inclination	98deg	98deg
	Repeat	6 days (89 revol.)	3 days (44 revol.)
Launch	Vehicle	H-IIA	H-IIA
	Schedule	JFY2017	23 Jan., 2009

Upgrade points

FTS-2:
- CO detectability
- Intelligent pointing
- Full programmable pointing

CAI-2:
- Forward/Backward looking
- 340nm detectability
- Bi-directional detectability

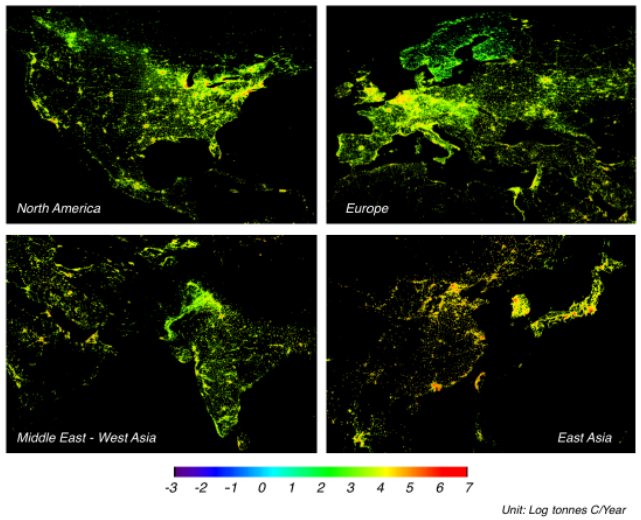
GOSAT-2 observation scheme



- **Full programmable target pointing**
- **Intelligent pointing for avoiding cloud**

Strategic observation by full programmable target pointing

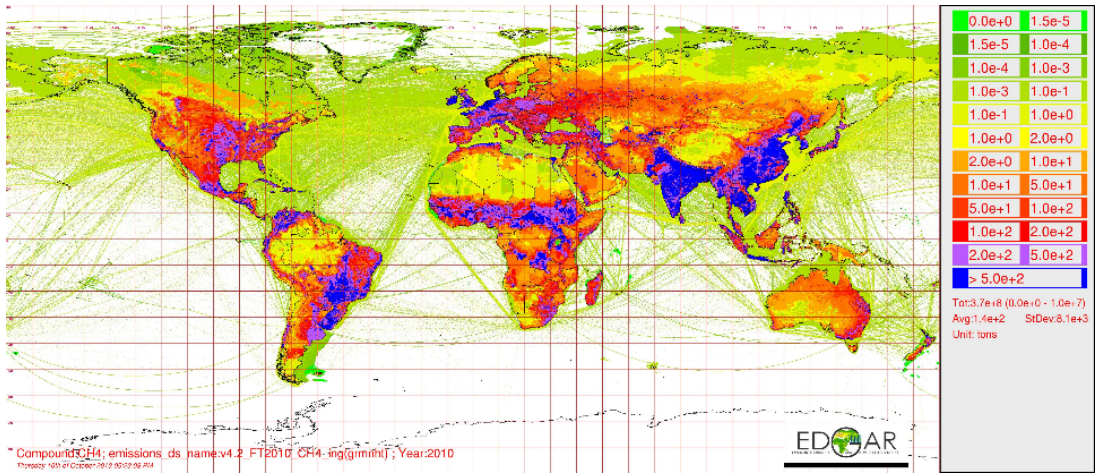
CO_2 emission database



ODIAC, Oda and Maksyutov, ACP, 2011

Different emission patterns

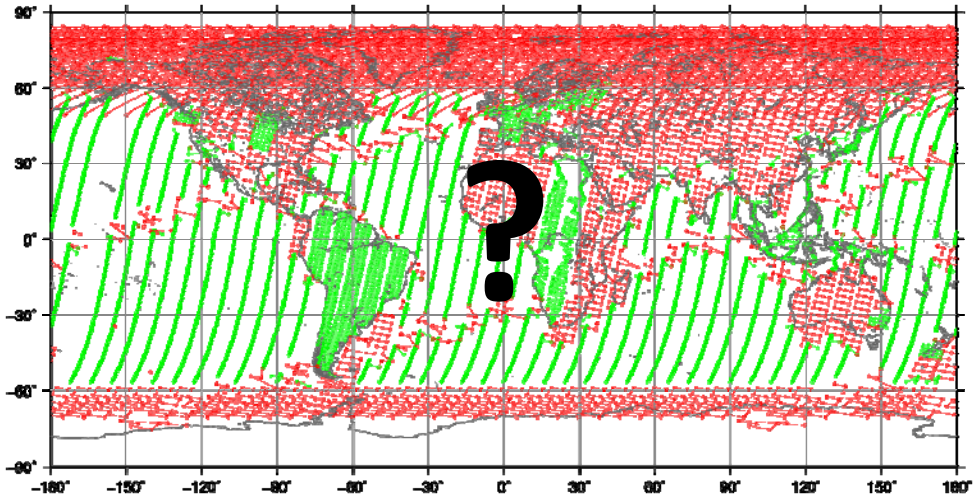
CH_4 emission database



EDGAR v4.2, EC, JRC/PBL

- Clear sky area by using cloud cover climatology
- Reducing observation uncertainty (less surface roughness, low aerosol, view direction etc.)
- Observation numbers and locations for flux inversions

More optimized sampling locations

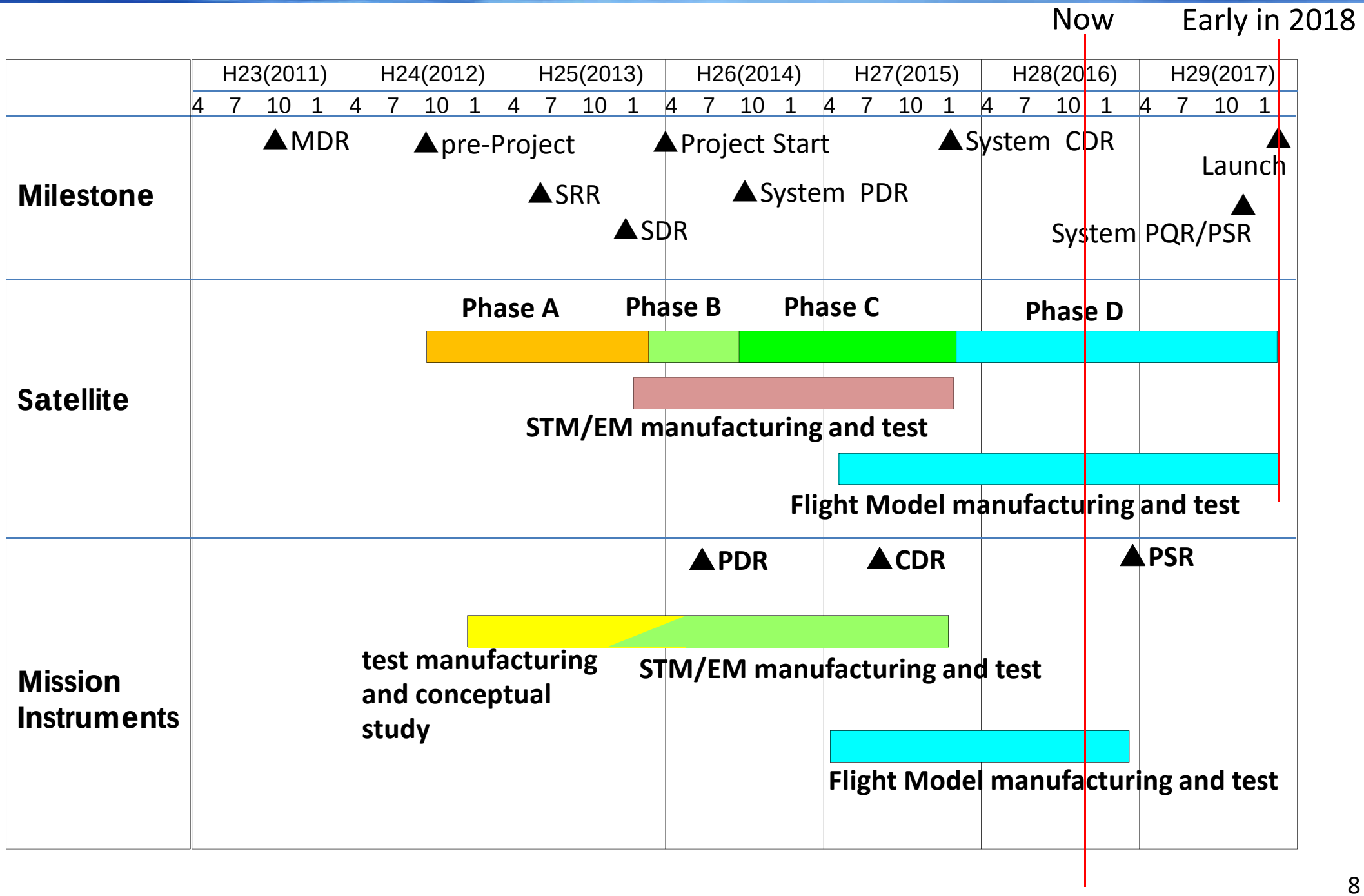


Intelligent pointing for clear-sky data

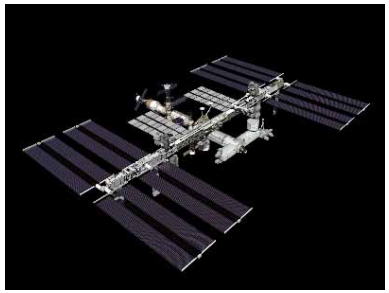
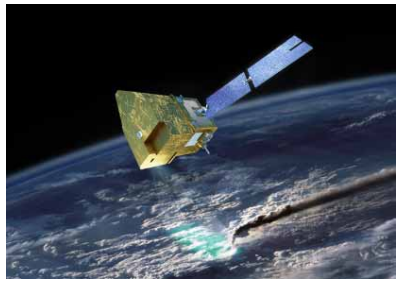
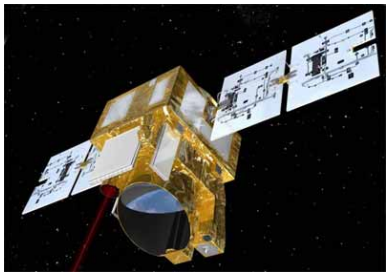
The GOSAT-2 FTS views pre-determined programming locations. However, cloud scene is an interference of GHG observation in the surface layer.

The intelligent pointing system is an automatically detection of the cloud area on orbit by using visible monitor camera and changing the pointing direction before the data acquisition.

GOSAT-2 development schedule



Space-borne GHG monitoring with partners

SCIAMACHY (ESA) 2003-2012 CO_2, CH_4	GOSAT (Japan) 2009-present CO_2, CH_4	OCO-2 (NASA) 2014-present CO_2	TanSat (China) 2016- CO_2	TROPOMI / S-5P 2017- CH_4
				
GOSAT-2 (Japan) 2018- CO_2, CH_4	OCO-3 (NASA) 2018- CO_2	MicroCarb (CNES) 2020- CO_2, CH_4	MERLIN (CNES/DLR) 2021- CH_4	Future proposals UVNS / S-5 (Europe) Lidar mission (NASA) Carbon mission (Europe)
				

Continuous GHG measurement from space will contribute to reveal global and regional carbon flux change.