GOSAT-2 mission status

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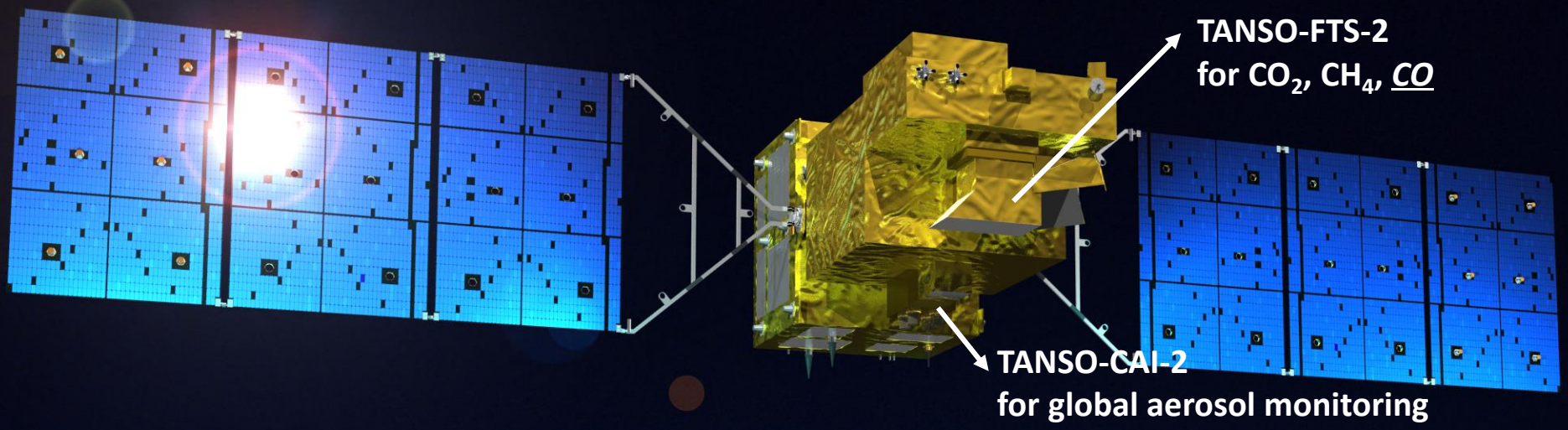
Outline of GOSAT-2



		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
	Schedul	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

Observation Targets of GOSAT-2

	GOSAT-2	GOSAT
improvement of concentration measurement precision	**0.5 ppm (CO2)** **5 ppb (CH4)** **- 1 month** **- 500 km mesh (land)** **- 2,000 km mesh (ocean)**	4 ppm (CO2) 34 ppb (CH4) - 3 months - 1,000km mesh (land)
improvement of estimation accuracy of flux	**estimate the monthly net fluxes with the accuracy of ±100%** **- 1,000 km mesh (land)** **- 4,000 km mesh (ocean)**	reduce the annual estimation error to half compared with the existing estimation error -sub-continental scale
estimation of the anthropogenic emission	**examine the feasibility of the estimation of the anthropogenic emission with the observation of CO which is the correlated matter**	---------
monitoring of the aerosols in the atmosphere	**calculate the optical thickness of the aerosols at 550nm and 1.6μm with 0.1 accuracy**	---------

Approaches to Achieving the targets

Improvement of concentration measurement precision

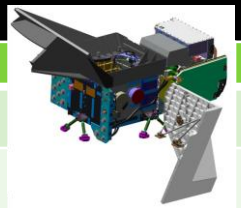
⇨Increase of the number of the useful data

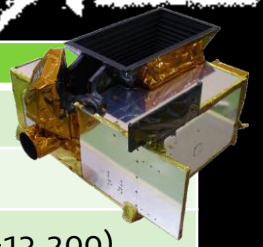
- **intelligent pointing**: steer the line of sight to the area where there is no cloud
- **increase of the SNR**: to acquire the data in the high latitude region

⇨Increase of the SNR of each data

- **increase the signal level----------**
  - **expansion of the aperture**
- **reduction of the noise level------**
  - **over sampling for band 1**
  - **set the pre-amplifier to the detector directly**

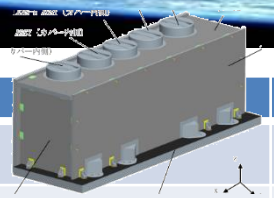
TANSO-FTS-2 specifications

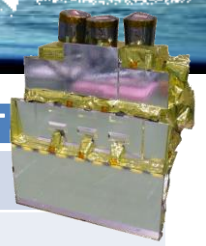




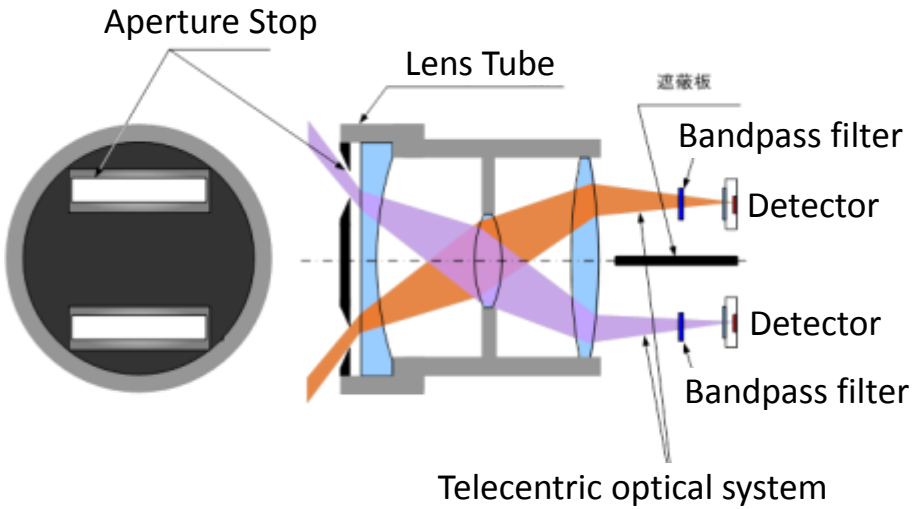
Items	GOSAT-2	GOSAT
Measurement Gases	CO_2, CH_4, O_3, H_2O, **CO**	CO_2, CH_4, O_3, H_2O
FOV	**9.7 kmϕ** / 15.8mrad	10.5 kmϕ / 15.8mrad
Spectral Ranges (μm)(cm-1)	band 1 : 0.75-0.77 (**12,950-13,250**) band 2: 1.56-**1.69** (**5,900**-6,400) band 3: 1.92-**2.33** (**4,200**-5,200) band 4: **5.5-8.4 (1,188-1,800)** band 5: **8.4-14.3 (700-1,188)**	band 1: 0.75-0.77 (12,900-13,200) band 2: 1.56-1.72 (5,800-6,400) band 3: 1.92-2.08 (4,800-5,200) band 4: 5.5-14.3 (700-1,800)
SNR	band 1: **562** (P@13,050cm^{-1}) (>400) band 2: **509** (P@6,200cm^{-1}) (>300) band 3: **379** (P@5,000cm^{-1}) (>300) **409** (P+S@4,250cm^{-1}) (>300) band 4: **1045** (@1,300cm^{-1}) (>300) band 5: **350** (@700cm^{-1}) (>300)	band 1: 345 (>300) band 2: 322 (>300) band 3: 412 (>300) band 4: 304 (>300)
Spatial interval	160km (5 points in the CT direction)	160km (5 points in the CT direction)
Scan duration	**4 seconds / interferogram**	4, 2, 1.1 seconds / interferogram
Sampling resolution	0.2cm^{-1}	0.2cm^{-1}
Effective Aperture size	**Φ73mm**	Φ64mm
Gain steps	**16**	2
Quantization	**14 bits (16 bits equivalent by over sampling)**	16 bits
Avoidance of the cloud	**Intelligent pointing**	-------

TANSO-CAI-2 specifications

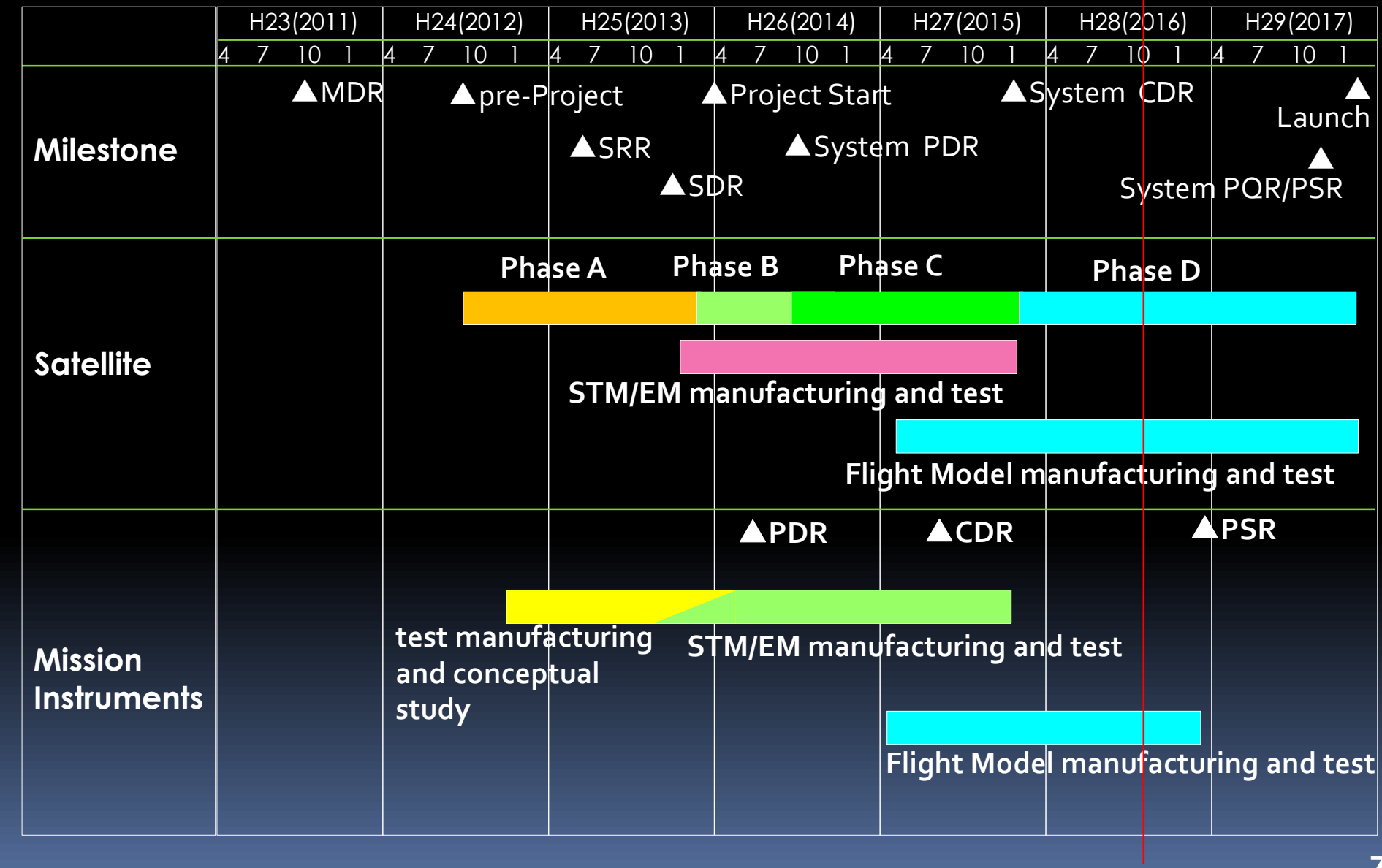




Items	GOSAT-2		GOSAT
Spectroscopic System	Band pass filter		Band pass filter
Spectral Ranges (nm)	Forward Viewing	Backward Viewing	
	band 1 : 330-350	band 6 : 370-390	**band 1 :** 370-390
	band 2: 425-445	**band 7 : 540-560**	**band 2 :** 664-684
	band 3 : 660-680	**band 8 : 660-680**	**band 3 :** 860-880
	band 4 : 860-880	**band 9 : 860-880**	**band 4 :** 1555-1645
	band 5 : 1555-1645	**band 10 : 1555-1645**	
Spatial Resolution/ swath	500m/1,000km (except band 5 and 10) **1km/1,000km** (band 5 and 10)		Band 1-3: 500m/1,000km Band 4: 1,500m/750km



Development Schedule



Summary

- GOSAT-2 science requirements are based on the GOSAT (CO_2, CH_4, TIR profile) and upgraded in:

  high SNR

  adding targets (CO, SIF, precise aerosol properties)

- GOSAT-2 sensor and satellite are under development toward the launch in early 2018.

- GOSAT-2 will collaborate with other GHG satellites on orbit.