GOSAT - 2

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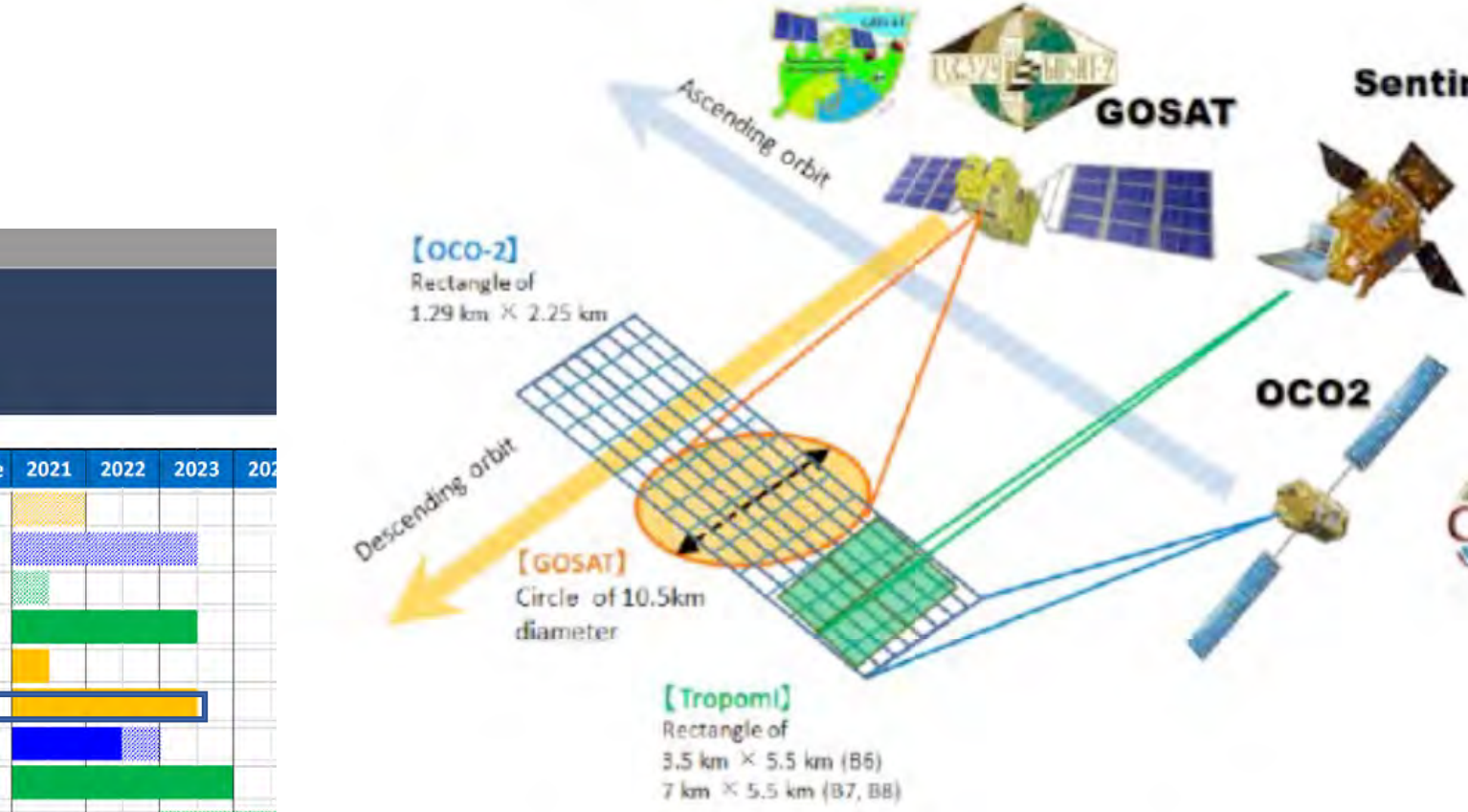
GHG Satellites

CO2 and CH4 Deployment Timeline

Satellite, Instrument	Agency/Origin	CO_2	CH_4	Public	Private
GOSAT TANSO-FTS	JAXA-NIES-MOE/Japan	●	●	●	
OCO-2	NASA/USA	●		●	
GHGSat-D - Claire	GHGSat/Canada		●		●
Sentinel 5P TROPOMI	ESA/Europe		●	●	
GaoFen-5 GMI	CHEOS/China	●	●	●	
GOSAT-2 TANSO-FTS-2	JAXA-NIES-MOE/Japan	●	●	●	
OCO-3	NASA/USA	●			
GHGSat C1/C2 - Iris, Hugo	GHGSat/Canada		●		●
MethaneSAT	EDF/USA	●	●		●
MicroCarb	CNES/France	●		●	
Carbon Mapper[1]	Carbon Mapper LLC/USA	●	●	●	●
GeoCarb	NASA/USA	●	●	●	
MetOp Sentinel-5 series	EC Copernicus/Europe		●	●	
GOSAT-GW	JAXA-NIES-MOE/Japan	●	●	●	
MERLIN	DLR/Germany-CNES/France		●	●	
CO2M	EC Copernicus/Europe	●	●	●	



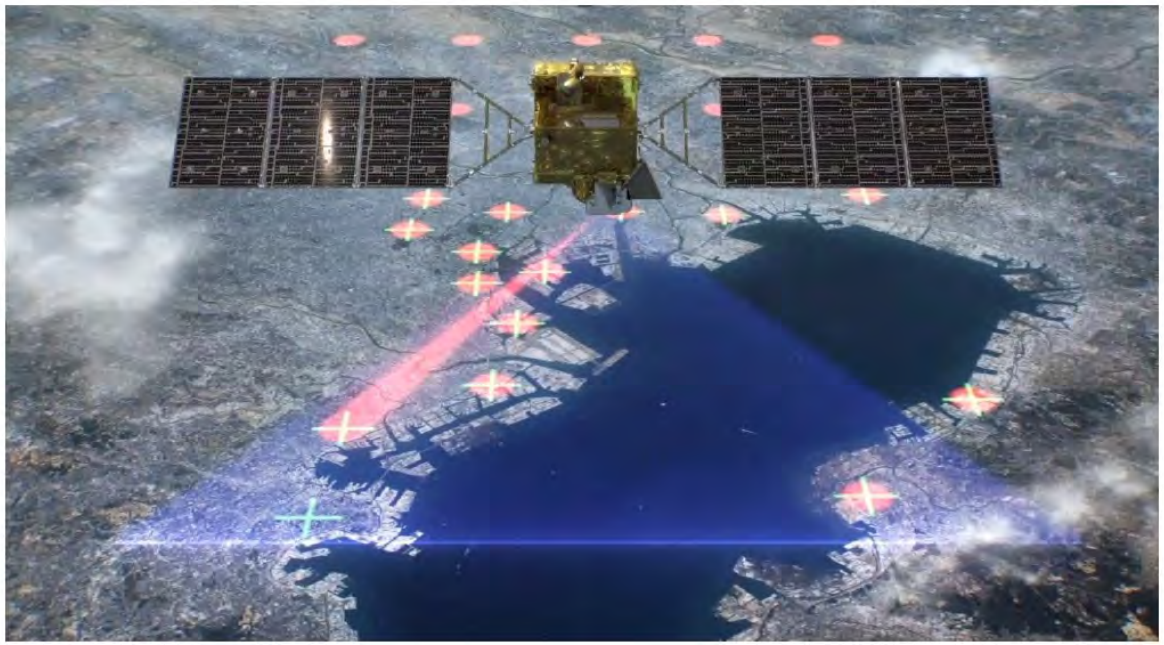
The GOSAT Satellites

Project	GOSAT-GW	GOSAT	GOSAT-2
Image			
Launch	JFY2023	2009/1/23	2018/10/29
Local observation time	13:30	13:00	13:00
Revisit time	3 days	3 days	6 days
Observation target	CO_2, CH_4, NO_2 SIF(Solar-induced chlorophyll fluorescence)	CO_2, CH_4, SIF(Solar-induced chlorophyll fluorescence)	CO_2, CH_4, CO SIF(Solar-induced chlorophyll fluorescence)
Observation mode	Wide swath mode Narrow swath mode	Grid mode Target mode	Targe mode (fully programable)
L1 processing and distribution	JAXA produces L1 products NIES (only) distributes L1 products	JAXA produces L1 products JAXA and NIES distribute L1 products	JAXA produces L1 products JAXA and NIES distribute L1 products
L2 processing	NIES (Operational) TBD (research)	NIES(Operational) NASA/JPL, Universities (Research), JAXA/EORC (Advanced research)	NIES(Operational) Universities (Research) JAXA/EORC (Advanced research)

Instrument overview: TANSO & TANSO-2

- TANSO and TANSO-2 (Thermal and near-infrared sensor for carbon observation) are equipped the Fourier transform spectrometer for SWIR and TIR bands to observe CO_2, CH_4, CO (for GOSAT-2).
- TANSO and TANSO-2 are accommodated two observation modes: grid mode and target mode with 2-axis agile pointing system for intense observation over megacities.

Grid observation



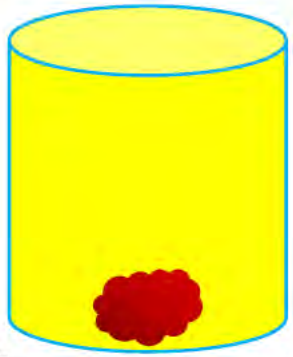
Target observation

NYC, Boston, LA are routinely observed by targeting mode

New York City

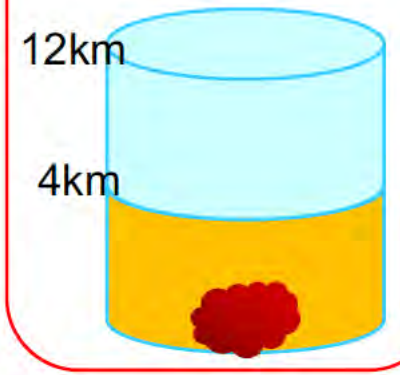
Conventional Method

Use only solar reflected light



JAXA/EORC new Method

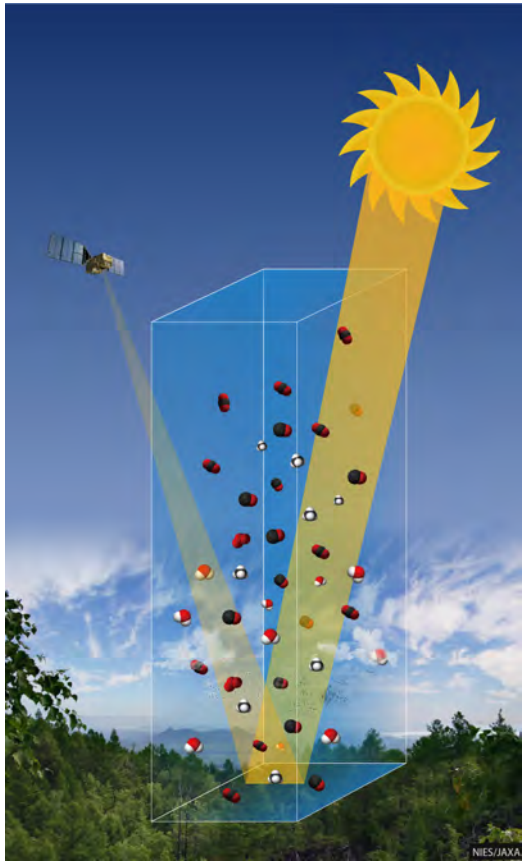
Use both solar reflected light & thermal



Products

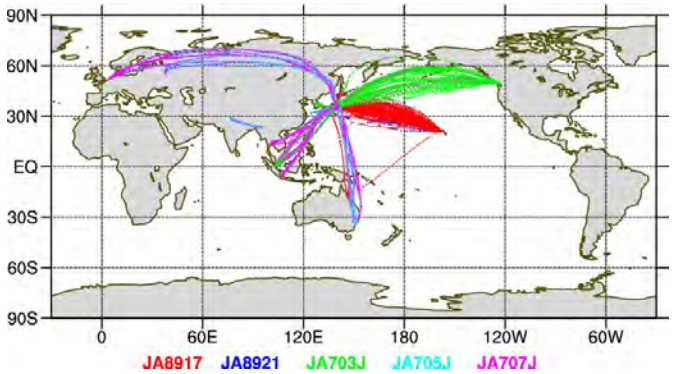
- GOSAT-2 TANSO-FTS-2 SWIR L2 Chlorophyll Fluorescence and Proxy-method Product
  - Chlorophyll fluoresce
- GOSAT-2 TANSO-FTS-2 SWIR L2 Column-averaged Dry-air Mole Fraction Product
  - CO2, CH4, CO
  - Shortwave (1.6 um)
  - Full Physics
- GOSAT-2 TANSO-FTS-2 TIR L2 Cloud and Aerosol Property Product
  - Thermal infrared
- GOSAT-2 TANSO-FTS-2 TIR L2 Temperature and Gas Profile Product
  - Thermal infrared
- GOSAT-2 TANSO-CAI-2 L2 Cloud Discrimination Product
  - Clouds – to determine clear sky for gas dry mole fraction
- GOSAT-2 TANSO-CAI-2 L2 Aerosol Property Product
  - Aerosol - aerosol optical thickness of aerosol and Ångström exponent values of multiple pixels

Satellite Evaluation

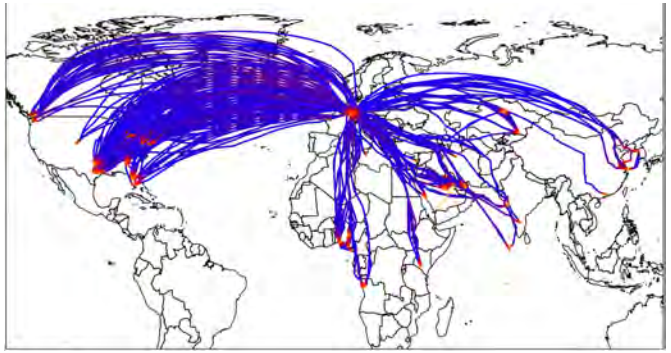


The only real way to evaluate satellite retrievals is by using profiles

Contrail



IAGOS



Light Aircraft