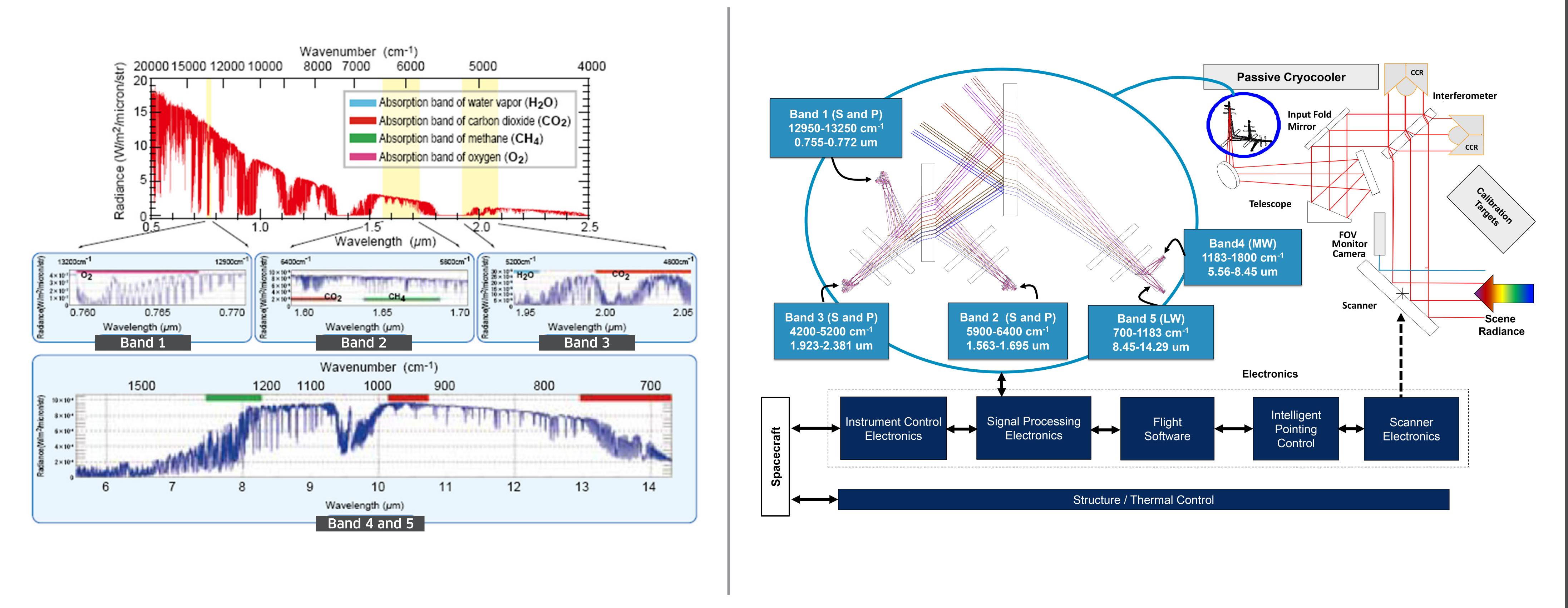
# The TANSO-FTS-2 Instrument for the GOSAT-2 Greenhouse Gas Monitoring Mission

Ron Glumb, Christopher Lietzke, James Bougher, Alan Bell and Christopher Ellsworth - Exelis, Geospatial Systems (GS), Fort Wayne, Indiana USA

## **GOSAT-2** Provides Improved Measurements of Greenhouse Gases

TANSO-FTS-2 is a primary instrument aboard GOSAT-2. It measures high-resolution spectra of upwelling earth radiance in 5 spectral bands (left) to extract concentrations of greenhouse gases ( $CO_2$ ,  $CH_4$ ) and artificial emission sources (CO). Optical configuration is shown at right. (The development of TANSO-FTS-2 is being performed under a subcontract by Mitsubishi Electric Corporation, the GOSAT-2 prime contractor of Japan Aerospace Exploration Agency (JAXA) GOSAT-2 Project.)



## New Design Features Enable Improved Mission Performance for GOSAT-2

GOSAT-2 Design Feature	Mission Ben
> CrIS-Based Passive Detector Cooler	Inherently rel
> New Intelligent Pointing Function	Detects cloud
> Highly Accurate and Stable Scanner	Minimizes sce
> Very Linear Signal Outputs	Minimizes rac
> Interferometer Improvements	More stable la
> Target for ILS Characterization	Accurate on-o
> Multiple Spectralon Surfaces in Solar Calibration Target	Excellent kno
> Flight-Proven High-Emissivity Infrared Calibration Target	CrIS-based ta of infrared da

#### nefits

liable, achieves temperatures needed for IR detectors

d-free areas and repoints scanner in real-time to maximize the number of cloud-free measurements

cene-induced interferogram fluctuations during data collects

adiance errors due to nonlinearity effects

laser metrology laser outputs and more stable ZPD position

-orbit ILS characterizations in two spectral bands

owledge of solar calibration target radiances over life

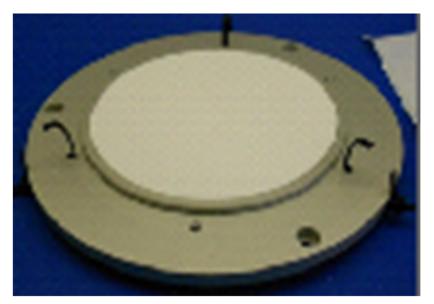
arget provides emissivity>0.995 and temperature errors <100mK for precise calibration

## **TANSO-FTS-2** Instrument Design Leverages Flight-Proven Assemblies

#### Heritage Assemblies



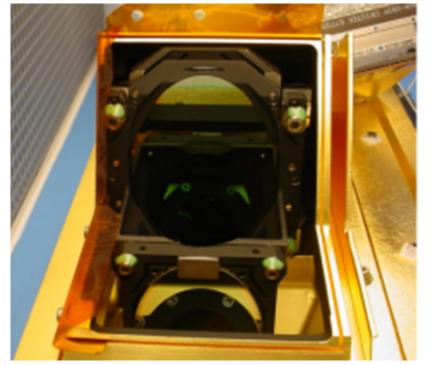
light Softwar



HI-based Solar alibration Target



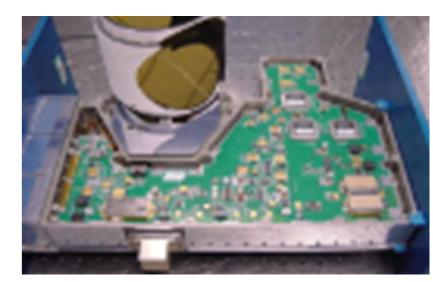
FOV Monitor Camera



CrIS-based Telescope and Aft Optics



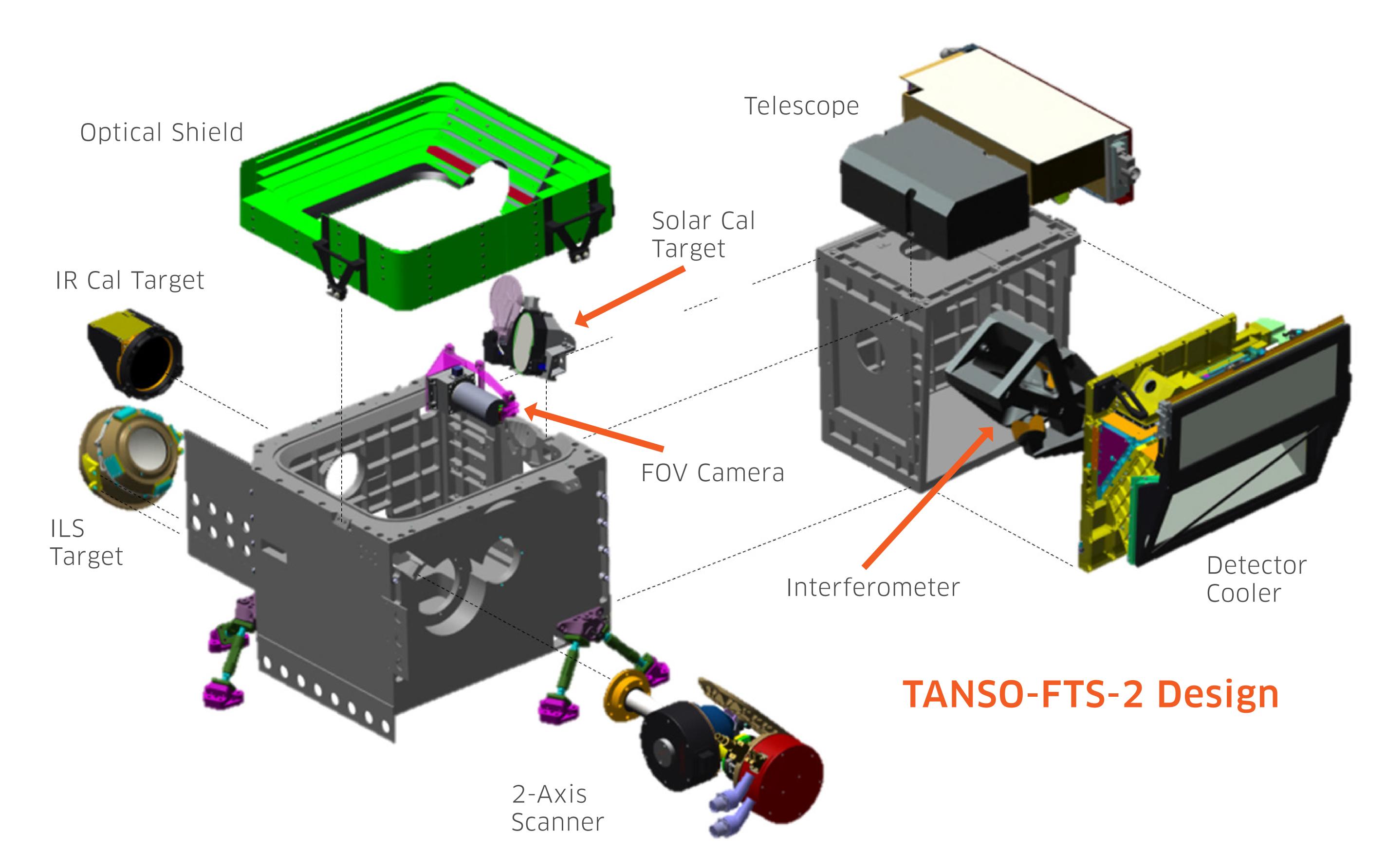




Two-Axis Scanne

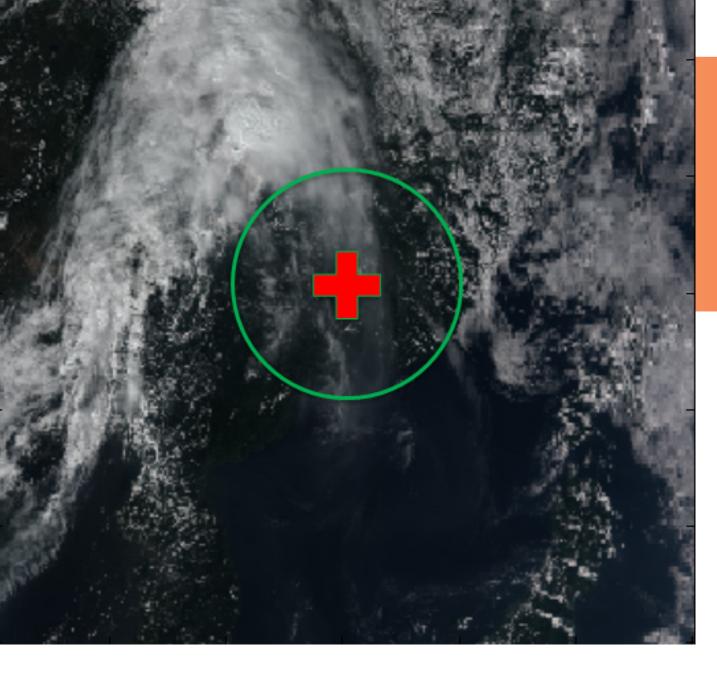


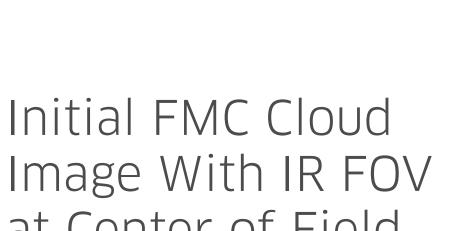
State-of-the-art Infrared Calibration Target



#### TANSO-FTS-2 uses many previously flown subsystems (left) for maximum reliability, configured to meet GOSAT-2 requirements (right).

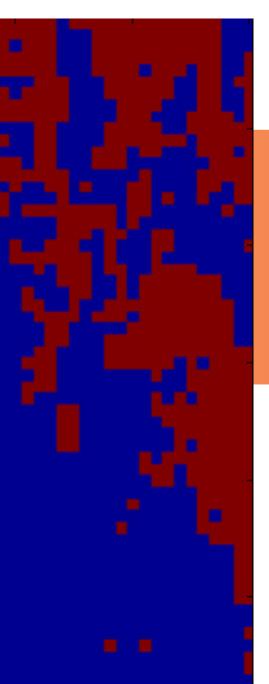




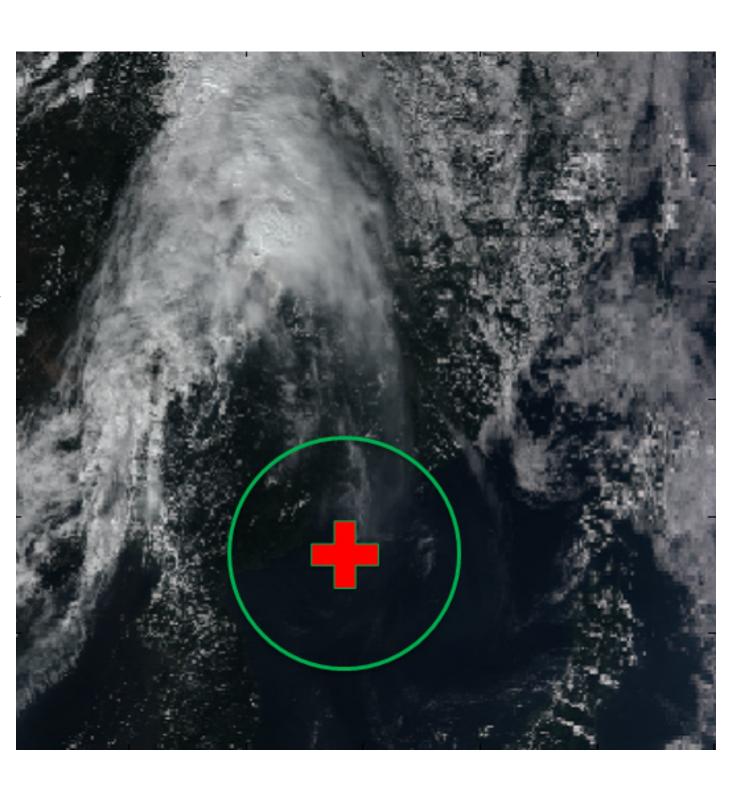


TANSO-FTS-2 includes new design features which address Lessons-Learned from the GOSAT-1 mission (see table at left). In particular, an Intelligent Pointing Function has been added (above), which is expected to nearly double the number of cloud-free measurements collected.

## 



A Cloud Mask of the Area is Produced to Identify Clear Area



IR FOV is Shifted to Clear Area; Interfer ogram Collect Starts