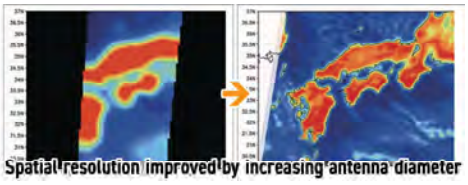
JAXA's SatelliteSensor Family Tree

JAXA's Earth observation began in 1978 with the establishment of the Earth Observation Center (EOC), starting with the reception of the U.S. NASA Earth observation satellite "Landsat-1," and in 1987, succeeded in developing and launching Japan's first Earth observation satellite, MOS-1. Since then, the series has continued with JERS-1, the TRMM/GPM precipitation radar series, ADEOS/ADEOS-II and their successors GCOM-W/GCOM-C, the ALOS series, the GOSAT series, EarthCARE, and the successor to GOSAT and GCOM-W, GOSAT-GW, capturing changes in the global environment for over 40 years.

The Earth Observation Research Center (EORC), established in 1995, has evaluated and analyzed these data, leading to numerous achievements. The data and information provided by JAXA are widely acknowledged by many related research and user organizations and have received high recognition from international partners, including NASA, NOAA, and ESA.

Microwave Radiometer

MSR → AMSR/AMSR-E → AMSR2 → AMSR3



Technology supporting the development of the sensor

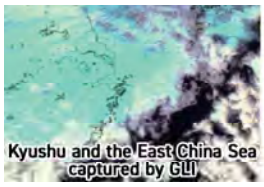
1. Expansion of the antenna diameter in the low-frequency channel that observes sea surface temperature and other parameters to improve spatial resolution
2. To fit the enlarged antenna into the limited space of the rocket, a deployable type was adopted
3. Improving sensor sensitivity to detect weak microwave signals
4. Addition of observation frequencies for artificial radio wave interference countermeasures
5. Data provision in near real-time for practical use

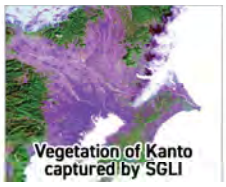
Satellite Navigator AMSR Series

AMSR web

Global Optical Radiometer

VTIR → OCTS → GLI → SGLI (VNR+IRS)





Technology supporting the development of the sensor

1. Increase in the number of observation channels
2. Improvement of sensor sensitivity for detecting each wavelength
3. Technology for efficiently transmitting massive global observation data
4. Improvement of resolution 1km->250m
5. Improvement of calibration technology (on-orbit calibration, lunar calibration, etc.)

Satellite Navigator GCOM-C

GCOM-C @EORC

Synthetic Aperture Radar

SAR → PALSAR → PALSAR-2 → PALSAR-3

Technology supporting the development of the sensor

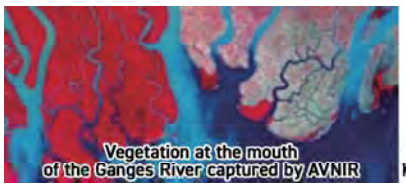
1. Beam control using phased array antennas for rapid observation during disasters
2. Wideband, high-power transmission system for high-resolution enhancement
3. Digital beamforming SAR method for expanding observation bandwidth

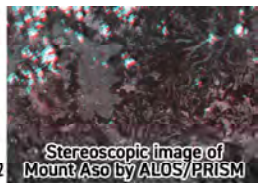
Satellite Navigator ALOS-4

ALOS Project

High-resolution optical radiometer

MESSR → OPS → AVNIR → PRISM+AVNIR-2 → ALOS-3





Technology supporting the development of the sensor

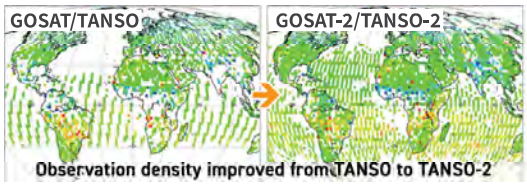
1. Increase in the number of observation channels
2. Improvement of sensor sensitivity to capture each wavelength
3. Stereo observation technology
4. Compression and transmission technology for large volumes of observational data
5. High-precision satellite orbit and attitude determination technology

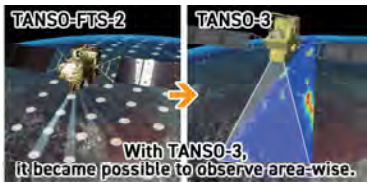
Satellite Navigator ALOS-3

ALOS Project (ALOS-3)

Greenhouse gas observation sensor

TANSO-FTS → TANSO-FTS-2 → TANSO-3





Technology supporting the development of the sensor

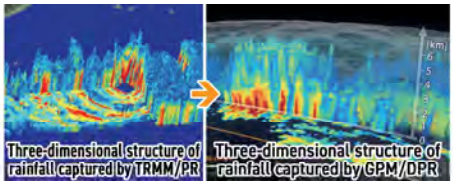
1. The world's first observation of greenhouse gases from space using a Fourier transform spectrometer
2. Increasing the density of observation points
3. And from point to surface

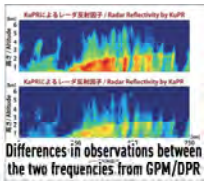
Satellite Navigator GOSAT-GW

GOSAT Series @EORC

Precipitation Radar

PR → DPR >> KuDPR (Under development)





Technology supporting the development of the sensor

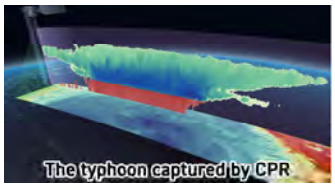
1. Three-dimensional observation of precipitation using phased array radar
2. Capture from light rain and snow to heavy rain comprehensively using dual frequencies
3. Understanding the movement of raindrops through Doppler observations

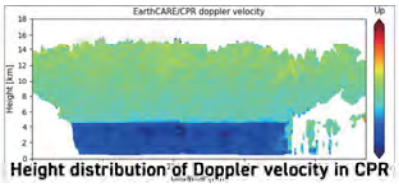
Satellite Navigator PMM

GPM website

Cloud Profiling Radar

CPR





Technology supporting the development of the sensor

1. Increased sensitivity using a large antenna (2.5m diameter)
2. Understanding the movement of cloud particle through Doppler observations

Satellite Navigator EarthCARE

EarthCARE @EORC