Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
3MI EUMETSAT (ESA)	EPS-SG-a	Being developed	Atmospheric chemistry	Measure aerosol parameters, air quality index, surface albedo, cloud information	Waveband: VIS-SWIR: 12 channels between 0.41 µm to 2.1 µm Spatial resolution: 4km Swath width: 2200x2200 km Accuracy:
ABI Advanced Baseline Imager NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Imaging multi-spectral radiometers (vis/IR)	Detects clouds, cloud properties, water vapour, land and sea surface temperatures, dust, aerosols, volcanic ash, fires, total ozone, snow and ice cover, vegetation index.	Waveband: 16 bands in VIS, NIR and IR ranging from 0.47 µm to 13.3 µm Spatial resolution: 0.5 km in 0.64 µm band; 2.0 km in long wave IR and in the 1.378 µm band; 1.0 km in all others Swath width: Accuracy: Varies by product
ACC Accelerometer ESA	Swarm	Operational	Precision orbit and space environment	Measurement of the spacecraft non-gravitational accelerations, linear accelerations range: +/- 2*10-4 m/s2; angular measurement range: +/- 9.6* 10-3 rad/s2; measurement bandwidth: 10-4 to 10-2 Hz; Linear resolution: 1.8*10-10 m/s2; angular resolution: 8*10-9 rad/s2.	Waveband: N/A Spatial resolution: 0.1 nm/s2 Swath width: N/A Accuracy: overall instrument random error: <10 - 8 m/s2
ACE-FTS Atmospheric Chemistry Experiment (ACE) Fourier Transform Spectrometer CSA	SCISAT-1	Operational	Atmospheric chemistry	Measure and understand the chemical processes that control the distribution of ozone in the Earth's atmosphere, especially at high altitudes.	Waveband: SWIR - TIR: 2 - 5.5 µm, 5.5 - 13 µm (0.02 cm-1 resolution) Spatial resolution: Swath width: Accuracy: Depends on species, meets requirements for climate variables
ACRIM III Active Cavity Radiometer Irradiance Monitor NASA	ACRIMSAT	Operational	Earth radiation budget radiometers	Measurements of solar luminosity and solar constant. Data used as record of time variation of total solar irradiance, from extreme UV through to infrared.	Waveband: UV - MWIR: 0.15 - 5 µm Spatial resolution: 5 deg FOV Swath width: 71 mins per orbit of full solar disk data Accuracy: 0.1% of full scale
Advanced DCS Advanced Data Collection System ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Data collection	Collects data on temperature (air/water), atmospheric pressure, humidity and wind speed/direction, speed and direction of ocean and river currents.	Waveband: Spatial resolution: Swath width: Accuracy:
Advanced GGAK-M Advanced Module for Geophysical Measurements (SEM) ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Space environment and magnetic field	Space Environmental Monitoring (SEM).	Waveband: Spatial resolution: Swath width: Accuracy:
Advanced GOCI Advanced Geostationary Ocean Colour Imager KARI	GEO-KOMPSAT-2B	Proposed	Ocean colour instruments	Ocean colour information, coastal zone monitoring, land resources monitoring.	Waveband: VIS - NIR: 0.40 - 0.88 µm (8 channels) Spatial resolution: 236 x 360 m Swath width: 1440 km Accuracy:
Advanced IKFS-2 Advanced Fourier spectrometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Atmospheric temperature and humidity sounders	Atmospheric temperature/humidity profiles, data on cloud parameters, water vapour & ozone column amounts, surface temperature.	Waveband: 3,7 - 15,5 µm, more then 8000 spectral channels Spatial resolution: 35 -100 km Swath width: 1000/2000 km Accuracy: 0.5 K
Advanced KMSS Advanced Multispectral Imager (VIS) ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging multi-spectral radiometers (vis/IR)	Multispectral images of land & sea surfaces and ice cover.	Waveband: 0.4 - 0.9 µm, 6 channels Spatial resolution: 60 m - 100 m Swath width: 900 km Accuracy:
Advanced MI Advanced Meteorological Imager KARI	GEO-KOMPSAT-2A	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring capability for the near real-time generation of high-resolution meteorological products and long-term change analysis of sea surface temperature and cloud coverage.	Waveband: 1: VIS, 0.55 - 0.80 µm; 2: SWIR: 3.50 - 4.00 µm; 3: WV (Waver Vapour): 6.50 - 7.00 µm; 4: TIR1 (Thermal Infrared 1): 10.3 - 11.3 µm, 5: TIR2 (Thermal Infrared 2): 11.5 - 12.5 µm Spatial resolution: VIS: 0.5km, 1 km, IR: 2 km Swath width: Full Earth disk Accuracy:
Advanced MSU-MR Advanced Multispectral scanning imager-radiometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging multi-spectral radiometers (vis/IR)	Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection.	Waveband: VIS: 0.5 - 0.7 µm; NIR: 0.7 - 1.1 µm; SWIR: 1.6 - 1.8 µm; MWIR: 3.5 - 4.1 µm; TIR: 10.5 - 11.5 µm, 11.5 - 12.5 µm Spatial resolution: 1 km Swath width: 3000 km Accuracy: VIS: 0.5%; IR: 0.1 - 0.2 K
Advanced MTVZA Advanced Scanning microwave imager-sounder ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging multi-spectral radiometers (passive microwave)	Atmospheric temperature and humidity profiles, precipitation, sea-level wind speed, snow/ice coverage.	Waveband: 10.6 - 183.3 GHz, 26 channels Spatial resolution: 12 - 75 km Swath width: 2600 km Accuracy: 0.4 - 2.0 K depending on spectral band
Advanced Radiomet Advanced Radio-occultation receiver ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Atmospheric temperature and humidity sounders	Atmospheric temperature and humidity profiles with high vertical resolution.	Waveband: Spatial resolution: Swath width: Accuracy:
Advanced SAR Advanced Synthetic Aperture Radar X band ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging microwave radars	High resolution microwave radar images for ice watch.	Waveband: X-Band Spatial resolution: 1 m, 5 m, 50 m, 200 m, 500 m Swath width: 10 km, 50 km, 130 km, 600 km, 750 km Accuracy: 1 dB
Advanced Scatterometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Scatterometers	Ocean surface wind measurements.	Waveband: C (or X) - band, TBD Spatial resolution: 25 km Swath width: 1800 km Accuracy: Wind speed: 2 m/s, direction: 20 grad
AEISS Advanced Electronic Image Scanning System KARI	KOMPSAT-3	Operational	High resolution optical imagers	High resolution imager for land applications of cartography and disaster monitoring.	Waveband: Panchromatic VIS: 0.50 - 0.90 µm, VIS: 0.45 - 0.52 µm, 0.52 - 0.60 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: Pan: 0.8 m; VNIR: 4 m Swath width: 15 km Accuracy:
AEISS-A Advanced Electronic Image Scanning System-A KARI	KOMPSAT-3A	Being developed	High resolution optical imagers	High resolution imager for land applications of cartography and disaster monitoring.	Waveband: Panchromatic VIS: 0.50 - 0.90 µm, VIS: 0.45 - 0.52 µm, 0.52 - 0.60 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: Pan: 0.8 m, VNIR: 4 m, IR: 5.5m Swath width: 15 km Accuracy:
AHI Advanced Himawari Imager JMA	Himawari-8, Himawari-9	Being developed	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, cloud motion, cloud height, cloud properties, water vapour, rainfalll, sea surface temperatures and Earth radiation, dust, aerosols, volcanic ash, fires, snow and ice cover.	Waveband: 16 bands in VIS, NIR and IR ranging from 0.46 µm to 13.3 µm VIS (~0.40 µm - ~0.75 µm) NIR (~0.75 µm - ~1.3 µm) SWIR (~1.3 µm - ~3.0 µm) MWIR (~3.0 µm - ~6.0 µm) TIR (~6.0 µm - ~15.0 µm) Spatial resolution: 0.5 km in 0.64 µm band; 1.0km in 0.46 µm, 0.51 µm and 0.86 µm band, 2.0 km in all others Swath width: Full Earth disk and several reserved sectors every 10 minutes Accuracy:
AIRS Atmospheric Infra-red Sounder NASA	Aqua	Operational	Atmospheric temperature and humidity sounders	High spectral resolution measurement of temperature and humidity profiles in the atmosphere. Long-wave Earth surface emissivity. Cloud diagnostics. Trace gas profiles. Surface temperatures.	Waveband: VIS - TIR: 0.4 - 1.7 µm, 3.4 - 15.4 µm, Has approximately 2382 bands from VIS to TIR Spatial resolution: 1.1 degree (13 x 13 km at nadir) Swath width: +/-48.95 degrees Accuracy: Humidity: 20%, Temperature: 1 K
AIS AIS Receiver NSC	Norsat-1	Proposed			Waveband: Spatial resolution: Swath width: Accuracy:

AIS (RCM) Automated Identification System (RADARSAT Constellation) CSA	RADARSAT C-1, RADARSAT C-2, RADARSAT C-3	Being developed	Data collection	Ship identification (name, location, heading, cargo, etc).	Waveband: VHF (162 MHz) Spatial resolution: N/A Swath width: 800 km minimum Accuracy: Better than 90% ship detection, for Class A ships, when ships are in view for a minimum of 5 minutes.
ALADIN Atmospheric Laser Doppler Instrument ESA	ADM-Aeolus	Being developed	Lidars	Global wind profiles (single line-of-sight) for an improved weather prediction.	Waveband: UV: 355 nm Spatial resolution: One wind profile every 200 km along track, averaged over 50 km Swath width: Along line 285 km parallel to satellite ground track Accuracy: Wind speed error below 2 m/s
ALI Advanced Land Imager NASA	NMP EO-1	Operational	High resolution optical imagers	Measurement of Earth surface reflectance. Will validate new technologies contributing to cost reduction and increased capabilities for future missions. ALI comprises a wide field telescope and multispectral and panchromatic instrument.	Waveband: 10 bands: VIS and NIR: 0.480 - 0.690 µm, 0.433 - 0.453 µm, 0.450 - 0.515 µm, 0.525 - 0.605 µm, 0.630 - 0.690 µm, 0.775 - 0.805 µm, 0.845 - 0.890 µm, 1.200 - 1.300 µm, SWIR: 1.550 - 1.750 µm, 2.080 - 2.350 µm Spatial resolution: PAN: 10 m, VNIR and SWIR: 30 m Swath width: 185 km Accuracy: SNR @ 5% surf refl Pan:220, Multi 1: 215, Multi 2: 280, Multi 3: 290, Multi 4:240, Multi 4':190, Multi 5':130, Multi 5:175, Multi 7:170 (prototype instrument exceeds ETM+ SNR by a factor of 4 - 8)
ALISS III Advanced LISS III ISRO	RESOURCESAT-3	Proposed	Imaging multi-spectral radiometers (vis/IR)	For crops and vegetation dynamics, natural resources census, disaster management and large scale mapping of themes.	Waveband: 3 bands in VNIR and 1 band in SWIR Spatial resolution: 23.5 m, 10 m Swath width: 700 km Accuracy:
ALT Radar Altimeter NSOAS (CAST)	HY-2A, HY-2B, HY-2C, HY-2D	Operational	Radar altimeters	Global ocean topography, sea level and gravity field measurements.	Waveband: 13.58 GHz and 5.25 GHz Spatial resolution: 16 km Swath width: 16 km Accuracy: < 4 cm
AltiKa Ka-band Altimeter CNES	SARAL	Operational	Radar altimeters	Sea surface height.	Waveband: 35.5 - 36 GHz, passive channels (radiometer): 24 (K-band) and 37 (Ka-band) GHz; active radar altimeter: 35 GHz (Ka-band) Spatial resolution: Swath width: Accuracy:
AMR Advanced Microwave Radiometer NASA	Jason-3, OSTM (Jason-2), SWOT	Operational	Imaging multi-spectral radiometers (passive microwave)	Altimeter data to correct for errors caused by water vapour and cloud-cover. Also measures total water vapour and brightness temperature.	Waveband: Microwave: 18.7 GHz, 23.8 GHz, 34 GHz Spatial resolution: 41.6 km at 18.7 GHz, 36.1 km at 23.8 GHz, 22.9 km at 34 GHz Swath width: 120 deg cone centred on nadir Accuracy: Total water vapour: 0.2 g/sq cm, Brightness temperature: 0.15 K
AMR-C AMR-C Climate-quality microwave radiometer NOAA (ESA, NASA)	Sentinel-6 A, Sentinel-6 B	Being developed			Waveband: Spatial resolution: Swath width: Accuracy:
AMSR-2 Advanced Microwave Scanning Radiometer -2 JAXA	GCOM-W, GCOM-W2, GCOM-W3	Operational	Imaging multi-spectral radiometers (passive microwave)	Measurements of water vapour, cloud liquid water, precipitation, winds, sea surface temperature, sea ice concentration, snow cover, soil moisture.	Waveband: Microwave: 6.925 GHz, 7.3 GHz, 10.65 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, 89.0 GHz Spatial resolution: 5 - 50 km (dependent on frequency) Swath width: 1450 km Accuracy: Sea surface temperature: 0.5 K, Sea ice cover: 10%, Cloud liquid water: 0.05 kg/m2, Precipitation rate: 10%, Water vapour: 3.5 kg/m2 through total column, Sea surface wind speed 1.5 m/s
AMSU-A Advanced Microwave Sounding Unit-A NASA	Aqua	Operational	Atmospheric temperature and humidity sounders	All-weather night-day temperature sounding to an altitude of 45 km.	Waveband: Microwave: 15 channels, 23.8 - 89.0 GHz Spatial resolution: 48 km Swath width: 2054 km Accuracy: Temperature profile: 2 K, humidity: 3 kg/m2, ice & snow cover: 10%
AMSU-A Advanced Microwave Sounding Unit-A NOAA (UKSA)	Metop-A, Metop-B, Metop-C, NOAA-15, NOAA-18	Operational	Atmospheric temperature and humidity sounders	All-weather night-day temperature sounding to an altitude of 45 km.	Waveband: Microwave: 15 channels, 23.8 - 89.0 GHz Spatial resolution: 48 km Swath width: 2054 km Accuracy: Temperature profile: 2 K, humidity: 3 kg/m2, ice & snow cover: 10%
AMSU-B Advanced Microwave Sounding Unit-B NOAA (UKSA)	NOAA-15	Operational	Atmospheric temperature and humidity sounders	All-weather night-day humidity sounding.	Waveband: Microwave: 89 GHz, 150 GHz, 183.3± 1.0 GHz (2 bands), 183.3± 3.0 GHz (2 bands), 183.3± 7.0 GHz (2 bands) Spatial resolution: 16 km Swath width: 2200 km Accuracy: Humidity profile: 1 kg/m2,
Aquarius L-Band radiometer NASA (CONAE)	SAC-D/Aquarius	Operational	Imaging multi-spectral radiometers (passive microwave)	L-band passive microwave radiometer measures brightness temperature of ocean to retrieve salinity.	Waveband: L-band (1.4 GHz) Spatial resolution: 100 km Swath width: 300 km Accuracy: 0.2 psu
Aquarius L-Band Scatterometer NASA (CONAE)	SAC-D/Aquarius	Operational	Scatterometers	L-band scatterometer to provide roughness correction to brightness temperature.	Waveband: L-Band (1.2 GHz) Spatial resolution: 100 km Swath width: 300 km Accuracy: 0.2 psu
ARGOS-3 CNES (NASA)	Metop-A, Metop-B, Metop-C, NOAA-15, NOAA-18, NOAA-19, SARAL	Operational	Data collection	Location data by Doppler measurements.	Waveband: UHF: 401 MHz, 467 MHz Spatial resolution: Swath width: Accuracy:
ARGOS-4 NOAA	EPS-SG-b, GOES-13, GOES-14, GOES-15, Metop-C, NOAA-19, SIDAR	Operational	Data collection	Data collection and communication system for receiving and retransmitting data from ocean and land-based remote observing platforms/transponders.	Waveband: UHF: 401 MHz, 467 MHz Spatial resolution: Swath width: Accuracy:
Arina ROSKOSMOS (ROSHYDROMET)	Resurs DK 1	Operational	Space environment	Insights into electromagnetic field variations as the precursors of earthquakes.	Waveband: Spatial resolution: Swath width: Accuracy:
ASCAT Advanced Scatterometer EUMETSAT (ESA)	Metop-A, Metop-B, Metop-C	Operational	Scatterometers	Measures wind speed and direction over ocean, soil moisture, sea ice cover, sea ice type, snow cover and snow parameters and vegetation parameters	Waveband: Microwave: C Band, 5.256 GHz Spatial resolution: Hi-res mode: 25 - 37 km, Nominal mode: 50 km Swath width: Continuous; 2 x 500 km swath width Accuracy: Wind speeds in range 4 - 24 m/s: 2 m/s and direction accuracy of 20 deg
ASI Atmospheric Sounding Interferometer CAST (NSMC-CMA)	FY-3D, FY-3E, FY-3F, FY-3G	Prototype	Atmospheric temperature and humidity sounders	Atmospheric sounding for weather forecasting.	Waveband: Spatial resolution: Swath width: Accuracy:
ASM Absolute Scalar Magnetometer CNES	Swarm	Operational	Magnetic field	Absolute calibration of Vector Field Magnetometer on board Swarm satellites.	Waveband: N/A Spatial resolution: 0.1 nT Swath width: N/A Accuracy: 0.1 nT
ASTER Advanced Spaceborne Thermal Emission and Reflection Radiometer METI (NASA)	Terra	Operational	High resolution optical imagers	Surface and cloud imaging with high spatial resolution, stereoscopic observation of local topography, cloud heights, volcanic plumes, and generation of local surface digital elevation maps. Surface temperature and emissivity.	Waveband: VIS and NIR: 3 bands in 0.52 - 0.86 µm, SWIR: 6 bands in 1.6 - 2.43 µm, TIR: 5 bands in 8.125 - 11.65 µm Spatial resolution: VNIR: 15 m, stereo: 15 m horizontally and 25 m vertical, SWIR: 30 m, TIR: 90 m Swath width: 60 km Accuracy: VNIR and SWIR: 4% (absolute), TIR: 4 K, Geolocation: 7 m
ATCOR Atmospheric correction ISRO	RESOURCESAT-3	Proposed	High resolution optical imagers	Atmospheric correction.	Waveband: VNIR Hyperspectral Spatial resolution: 40 m Swath width: 734 km Accuracy:
ATLAS Advanced Topographic Laser Altimeter System NASA	ICESat-II	Being developed	Lidars	Provide date on ice sheet height and sea ice thickness, land altitude, aerosol height distributions, cloud height and boundary layer height.	Waveband: VIS-NIR: Laser emits at 1064 nm (for altimetry) and 532 nm (for atmospheric measurements) Spatial resolution: 66 m spots separated by 170 m Swath width: Accuracy: Aerosol profile: 20%, Ice elevation: 20 cm, Cloud top height: 75 m, Land elevation: 20 cm, geoid: 5 m

ATLID ATmospheric LIDar ESA	EarthCARE	Approved	Lidars	Derivation of cloud and aerosol properties - Measurement of molecular and particle backscatter in Rayleigh, co-polar and cross-polar Mie channels.	Waveband: Laser at 355 nm Spatial resolution: 300 m horizontal (TBC) Swath width: Accuracy:
ATMS Advanced Technology Microwave Sounder NASA (NOAA)	JPSS-1, JPSS-2, Suomi NPP	Operational	Atmospheric temperature and humidity sounders	Collects microwave radiance data that when combined with the CrIS data will permit calculation of atmospheric temperature and water vapour profiles.	Waveband: Microwave: 22 bands, 23-184 GHz Spatial resolution: 5.2 - 1.1 deg Swath width: 2300 km Accuracy: 0.75 K - 3.60 K
ATOVS (HIRS/3 + AMSU + AVHRR/3) Advanced TIROS Operational Vertical Sounder NOAA	NOAA-15	Operational	Atmospheric temperature and humidity sounders	Advanced TIROS Operational Vertical Sounder instrument suite.	Waveband: Spatial resolution: Swath width: Accuracy:
AVHRR/3 Advanced Very High Resolution Radiometer/3 NOAA	Metop-A, Metop-B, Metop-C, NOAA-15, NOAA-18, NOAA-19	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurements of land and sea surface temperature, cloud cover, snow and ice cover, soil moisture and vegetation indices. Data also used for volcanic eruption monitoring.	Waveband: VIS: 0.58 - 0.68 µm, NIR: 0.725 - 1.1 µm, SWIR: 1.58 - 1.64 µm, MWIR: 3.55 - 3.93 µm, TIR: 10.3 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: 1.1 km Swath width: 3000 km approx, Ensures full global coverage twice daily Accuracy:
AWiFS Advanced Wide Field Sensor ISRO	RESOURCESAT-2, RESOURCESAT-2A	Operational	Imaging multi-spectral radiometers (vis/IR)	Vegetation and crop monitoring, resource assessment (regional scale), forest mapping, land cover/ land use mapping, and change detection.	Waveband: VIS: 0.52 - 0.59 µm and 0.62 - 0.68 µm, NIR: 0.77 - 0.86 µm, SWIR: 1.55 - 1.7 µm Spatial resolution: 55 m Swath width: 740 km Accuracy: 10 bit data
BBR (EarthCARE) BroadBand Radiometer (EarthCARE) ESA	EarthCARE	Approved	Earth radiation budget radiometers	Top of the atmosphere radiances and radiative flux.	Waveband: Shortwave channel: 0.2 - 4 µm, Total channel 0.2 - 50 µm Spatial resolution: 10 x 10 km ground pixel size for each of the three views Swath width: Accuracy: flux retrieval accuracy 10 Wm-2
BRLK X-band Synthetic Aperture Radar ROSHYDROMET (ROSKOSMOS)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2, Obzor-R N1, Obzor-R N2, Obzor-R N3, Obzor-R N4	Operational	Imaging microwave radars		Waveband: X-band Spatial resolution: 500 m and 1000 m Swath width: Accuracy:
C-Band SAR C-Band Synthetic Aperture Radar ESA	Sentinel-1 A, Sentinel-1 B, Sentinel-1 C	Operational	Imaging microwave radars	Marine core services, land monitoring and emergency services. Monitoring sea ice zones and arctic environment. Surveillance of marine environment, monitoring land surface motion risks, mapping of land surfaces (forest, water and soil, agriculture), mapping in support of humanitarian aid in crisis situations.	Waveband: C-band: 5.405 GHz; HH, VV, HH+HV, VV+VH; Incidence angle: 20-45 Spatial resolution: Strip mode: 9 m, Interferometric wide swath mode: 20 m, extra-wide swath mode: 50 m, wave mode: 50 m Swath width: Strip mode: 80 km; Interferometric wide swath mode: 250 km, extra-wide swath mode: 400 km, Wave mode: sampled images of 20 x 20 km at 100 km intervals Accuracy: NESZ: -22 dB; PTAR: -25 dB; DTAR: -22 dB; Radiometric accuracy 1 dB (3 sigma); Radiometric stability: 0.5 dB (3 sigma)
CALIOP Cloud-Aerosol Lidar with Orthogonal Polarization NASA	CALIPSO	Operational	Lidars	Two-wavelength, polarisation lidar capable of providing aerosol and cloud profiles and properties.	Waveband: 532 nm (polarization-sensitive), 1064 nm, VIS - NIR Spatial resolution: Vertical sampling: 30 m, 0 – 40 km Swath width: 333 m along-track Accuracy: 5% (532 nm)
CARMEN-1 (ICARE) Influence of Space Radiation on Advanced Components CNES (CONAE)	SAC-D/Aquarius	Operational	Space environment	Studying space environment effects.	Waveband: Spatial resolution: Swath width: Accuracy:
CARMEN-1 (SODAD) Orbital System for an Active Detection of Debris CNES (CONAE)	SAC-D/Aquarius	Operational	Space environment	Space debris studies.	Waveband: Spatial resolution: Swath width: Accuracy:
CCD (HJ) CCD camera CAST	HJ-1A, HJ-1B	Operational	High resolution optical imagers	Multispectral measurements of Earth's surface for natural enviroment and disaster applications.	Waveband: 0.43 - 0.90 µm (4 bands) Spatial resolution: 30 m Swath width: 360 km (per set), 720 km (two sets) Accuracy:
CCD (ZY-02C and ZY-3) CCD and multispectral imager CRESDA	ZY-02C, ZY-3	Operational	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.5-0.8 µm Spatial resolution: 2.36m (ZY-02C HR) 2.1m(ZY-3) Swath width: 52km(ZY-3) 54km(ZY-02C) Accuracy:
CCD camera Charged Coupled Device Camera ISRO	INSAT-3A	Operational	Imaging multi-spectral radiometers (vis/IR)	Cloud and vegetation monitoring.	Waveband: VIS: 0.62 - 0.68 µm; NIR: 0.77 - 0.86 µm; SWIR: 1.55 - 1.69 µm Spatial resolution: 1 x 1 km Swath width: Normal: 6000 (N-S) X 6000 km (E-W) anywhere on earth disc, Program: 6000 (N-S) X (n X 300) km (E-W): n and number of frames programmable Accuracy:
CEFI Canadian Electric Field Instrument CSA (ESA)	Swarm	Operational	Space environment and gravity instruments	Suprathermal ion imager and Langmuir probe to measure ion temp, electron temp, ion density, electron density, spacecraft potential and ion incident angle.	Waveband: N/A Spatial resolution: 0.3 mV/m Swath width: N/A Accuracy: <3 mV/m
CER Coherent EM Radio Tomography CSA	ePOP on CASSIOPE	Operational	Space environment	Radio transmission from e-POP to ground for radio propagation and ionospheric scintillation measurements.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
CERES Cloud and the Earth's Radiant Energy System NASA	Aqua, JPSS-1, Suomi NPP, Terra, TRMM	Operational	Earth radiation budget radiometers	Long term measurement of the Earth's radiation budget and atmospheric radiation from the top of the atmosphere to the surface; provision of an accurate and self-consistent cloud and radiation database.	Waveband: 3 channels: 0.3-5 µm, 0.3 - 100 µm, 8 - 12 µm Spatial resolution: 20 km Swath width: Accuracy: 0.5%, 1%, 0.3% (respectively for the 3 channels)
CHRIS Compact High Resolution Imaging Spectrometer ESA (UKSA)	PROBA	Operational	Imaging multi-spectral radiometers (vis/IR)	Supports a range of land, ocean and atmospheric applications, including agricultural science, forestry, environmental science, atmospheric science and oceanography.	Waveband: VIS - NIR: 400 - 1050 nm (63 spectral bands at a spatial resolution of 36 m; or 18 bands at full spatial resolution (18 m)) Spatial resolution: 36 m or 18 m depending on wavebands selected. Swath width: 14 km Accuracy: S/N 200 @ target albedo of 0.2. 12 bits digitisation.
CIRC Compact InfraRed Camera JAXA	ALOS-2	Operational	Other	Active fire detection. Land surface temperature.	Waveband: TIR: 8 - 12 µm Spatial resolution: 200m Swath width: 128 km Accuracy: 0.2 K@300 K
Cloud Radar Cloud radar (ACE) NASA	ACE	Proposed	Cloud profile and rain radars	Radar measurement for cloud droplets and precipitation.	Waveband: Dual frequency: 35 and 94 GHz Spatial resolution: Vertical: 250 m, Cross-track: 1.4 km, Along-track: 2.5 km Swath width: Instantaneous Footprint < 1 km Accuracy: TBD
CO Sensor (ASCENDS) NASA	ASCENDS	Proposed	Atmospheric chemistry	Measure the total column CO concentration.	Waveband: 2.3 µm Spatial resolution: Swath width: 200 m Accuracy:

CO2 and O2 LIDAR (ASCENDS) Combined CO2 and O2 column absorption LIDAR (ASCENDS) NASA	ASCENDS	Proposed	Lidars	Measure the number density of Carbon Dioxide (CO2) in the column. Measure length of the column using a laser altimeter and measure ambient air pressure and temperature.	Waveband: 1.57 µm Spatial resolution: Swath width: 200 m Accuracy: 1 ppm CO2; 2 K for temperature
COSI Corea SAR Instrument KARI	KOMPSAT-5	Operational	Imaging microwave radars	SAR for land applications of cartography and disaster monitoring.	Waveband: microwave Spatial resolution: High: 1 m Swath width: 100 km Accuracy:
CPR (CloudSat) Cloud Profiling Radar NASA	CloudSat	Operational	Cloud profile and rain radars	Primary goal to provide data needed to evaluate and improve the way clouds are represented in global climate models. Measures vertical profile of clouds.	Waveband: Microwave: 94 GHz Spatial resolution: Vertical: 500 m, Cross-track: 1.4 km, Along-track: 2.5 km Swath width: Instantaneous Footprint < 2 km Accuracy: detects ice clouds optical depth >1, water clouds optical depth >3, ice content to +100%, -50%, liquid content to <50%, in-cloud heating to within 1K day-1 km-1
CPR (EarthCARE) Cloud Profiling Radar (EarthCARE) JAXA (NICT)	EarthCARE	Being developed	Cloud profile and rain radars	Measurement of cloud properties, light precipitation, vertical motion.	Waveband: Microwave: 94 GHz Spatial resolution: Range resolution: 500m (100m sample) Horizontal resolution: 800m (500m sample) Swath width: Accuracy:
CrIS Cross-track Infrared Sounder NOAA	JPSS-1, JPSS-2, Suomi NPP	Operational	Atmospheric temperature and humidity sounders	Daily measurements of vertical atmospheric distribution of temperature, moisture, and pressure.	Waveband: MWIR - TIR: 3.92 - 4.4 µm, 5.7 - 8.62 µm, 9.1 - 14.7 µm, 1300 spectral channels Spatial resolution: IFOV 14 km diameter, 1 km vertical layer resolution Swath width: 2200 km Accuracy: Temperature profiles: to 0.9 K, Moisture profiles: 20 - 35%, Pressure profiles: 1%
CSG SAR COSMO Seconda Generazione SAR ASI (MoD (Italy))	CSG-1, CSG-2	Approved	Imaging microwave radars	All-weather images of ocean, land and ice for monitoring of land surface processes, ice, environmental monitoring, risk management, environmental resources, maritime management, Earth topographic mapping.	Waveband: Microwave: X-band (9.6 GHz) single-, dual- and quad- polarization Spatial resolution: [range x azimuth] Spotlight: 0,8x0,8 m (Single pol) 1x1 m (Single/Dual pol), Stripmap: 3x3 m (Single/Dual/Quad pol), ScanSAR: 4x20 or 6x40 m (Single/Dual pol) Swath width: 'Dual polarisation modes: Spotlight: 10 km, Stripmap: 40 km, ScanSAR: 100 or 200 km. Quad polarisation modes: 15 km. Accuracy: -
CZS Coastal Zone Scanner ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Approved	Ocean colour instruments	Coastal zone data, estimation of phytoplankton concentration.	Waveband: 0.4 - 0.79 µm, 4 channels Spatial resolution: 80 m Swath width: 800 km Accuracy:
DCS Data Collecting System Transponder INPE	SCD-1, SCD-2	Operational	Data collection	Data collection and communication.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS Data Collecting System Transponder INPE (CAST)	CBERS-4	Operational	Data collection	Data collection and communication.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS Data Collection System ROSKOSMOS (ROSHYDROMET)	Elektro-L N1, Elektro-L N2, Elektro-L N3, Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2, Meteor-M N3	Operational	Data collection	Collects data on temperature (air/water), atmospheric pressure, humidity and wind speed/direction, speed and direction of ocean and river currents.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS (GOES-R) Data Collection System (NOAA, GOES-R) NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Approved	Data collection	Collects data on temperature (air/water), atmospheric pressure, humidity and wind speed/direction, speed and direction of ocean and river currents.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS (SABIA_MAR) Data Collection System CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Proposed	Data collection	Environmental and meteorological data collection from ground platforms (UHF 401.62 MHz uplink // S-band downlink).	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: N/A
DCS (SAC-D) Data Collection System CONAE	SAC-D/Aquarius	Operational	Data collection	Environmental and meteorological data collection from ground platforms (UHF 401.55 MHz uplink).	Waveband: Spatial resolution: Swath width: Accuracy:
DDMI (CYGNSS) Delay Doppler Mapping Instrument (DDMI) NASA (NOAA)	CYGNSS	Being developed	Other	Constellation of bistatic radar receivers using GPS satellite transmitters to detect ocean surface roughness and estimate near surface wind speed from calm sea through hurricane force conditions and under all levels of precipitation.	Waveband: Microwave: 1.575 GHz Spatial resolution: 20-50 km (variable in ground processing) Swath width: Field of view of potential GPS specular point contacts extends 740 km cross-track in both port and starboard directions. Accuracy: wind speed RMS retrieval uncertainty: 2 m/s for winds less than 20 m/s and 10% for winds greater than 20 m/s
DORIS-NG Doppler Orbitography and Radio-positioning Integrated by Satellite-NG CNES	CryoSat-2, HY-2A, OSTM (Jason-2), Sentinel-6 A, Sentinel-6 B, SWOT	Operational	Precision orbit	Precise orbit determination; Real time onboard orbit determination (navigation).	Waveband: Spatial resolution: Swath width: Accuracy: Orbit error ~1 cm
DORIS-NG (SPOT) Doppler Orbitography and Radio-positioning Integrated by Satellite-NG (on SPOT) CNES	SPOT-5	Operational	Precision orbit	Precise orbit determination; Real time onboard orbit determination (navigation).	Waveband: Spatial resolution: Swath width: Accuracy: Orbit error ~1 cm
DPR Dual-frequency Precipitation Radar JAXA (NICT, NASA)	GPM Core	Operational	Cloud profile and rain radars	Measures precipitation rate classified by rain and snow, in latitudes up to 65 degrees.	Waveband: Microwave: 13.6 GHz (Ku band) and 35.5 GHz (Ka band) Spatial resolution: Range resolution: 125m (NS, MS mode), 250m (HS mode), Horizontal resolution: 5 km at nadir Swath width: 245 km (Ku-band), 125 km (Ka band) Accuracy: Rainfall rate 0.2 mm/h
DRT-S&R ISRO	INSAT-3A, KALPANA-1	Operational	Communications	Relay of search and rescue information.	Waveband: Spatial resolution: Swath width: Accuracy:
ECOSTRESS ECOsystem Spaceborne Thermal Radiometer Experiment on Space Station NASA	ECOSTRESS-on-ISS	Being developed	Imaging multi-spectral radiometers (vis/IR)	This project will use a high-resolution thermal infrared radiometer to measure plant evapotranspiration, the loss of water from growing leaves and evaporation from the soil.	Waveband: TIR Spatial resolution: Swath width: Accuracy:
EPIC Earth Polychromatic Imaging Camera NASA (NOAA)	DSCOVR	Being developed	Imaging multi-spectral radiometers (vis/IR)	Diurnal measurements of ozone, UV surface radiation, clouds and aerosols.	Waveband: 317 - 905 nm in 10 channels Spatial resolution: 8 km Swath width: Accuracy:
ERM Earth Radiation Measurement NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Earth radiation budget radiometers	Measures Earth radiation gains and losses on regional, zonal and global scales.	Waveband: 0.2 - 3.8 µm, 0.2 - 50 µm Spatial resolution: 25 km Swath width: 2200 km Accuracy: DLR/DSR10 watts/m2 net solar 3 w/m2 OLR 5 w/m2

ERM-2 Improved Earth Radiation Measurement NRSCC (NSMC-CMA, CAST)	FY-3E, FY-3G	Approved	Earth radiation budget radiometers	Measures Earth radiation gains and losses on regional, zonal and global scales.	Waveband: Spatial resolution: Swath width: Accuracy:
ES Electron Spectrometer NOAA (NASA)	DSCOVR	Being developed	Space environment		Waveband: Spatial resolution: Swath width: Accuracy:
ETM+ Enhanced Thematic Mapper Plus USGS (NASA)	Landsat 7	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures surface radiance and emittance, land cover state and change (eg vegetation type). Used as multi-purpose imagery for land applications.	Waveband: VIS - TIR: 8 bands: 0.45 - 12.5 µm Spatial resolution: PAN: 15 m, VIS - SWIR: 30 m, TIR: 60 m Swath width: 185 km Accuracy: 50 - 250 m systematically corrected geodetic accuracy
Event Imaging Spectrometer from GEO (GeoCape) NASA	GEO-CAPE	Proposed	High resolution optical imagers	Predictions of impacts from oil spills, fires, water pollution from sewage and other sources, fertilizer runoff, and other environmental threats. Detection and tracking of waterborne hazardous materials. Monitoring and improvement of coastal health.	Waveband: UV/VIS (310 - 481 nm) and the VIS/NIR (500 - 900 nm) Spatial resolution: 250 m spatial resolution, 20 - 50 nm (MODIS-like) spectral bands Swath width: 300 km swath width coastal regions an targets of opportunity Accuracy:
EXIS Extreme Ultraviolet and X-ray Irradiance Sensors NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Other	Monitors the whole-Sun X-ray irradiance in two bands and the whole-Sun EUV irradiance in five bands.	Waveband: Spatial resolution: N/A Swath width: Accuracy:
FAI Fast Auroral Imager CSA	ePOP on CASSIOPE	Operational	Space environment	Measures the large-scale auroral emissions in the 630-1100 nm wavelength range. The FAI imager system produces 16-bit digital images of the near infrared band at one image per second (again taking advantage of the non-rotating platform on CASSIOPE),and the 630-nm wavelength at two images per minute, giving adequate temporal resolution to investigate the above scientific objectives.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
FCI Flexible Combined Imager EUMETSAT (ESA)	MTG-I1 (imaging), MTG-I2 (imaging), MTG-I3 (imaging), MTG-I4 (imaging)	Being developed	Imaging multi-spectral radiometers (vis/IR)	Measurements of cloud cover, cloud top height, precipitation, cloud motion, vegetation, radiation fluxes, convection, air mass analysis, cirrus cloud discrimination, tropopause monitoring, stability monitoring, total ozone and sea surface temperature.	Waveband: VIS0.4=0.414 - 0.474 µm, VIS0.5=0.49 - 0.53 µm, VIS0.6=0.615 - 0.665 µm, VIS0.8=0.84 - 0.89 µm, VIS0.9=0.904 - 0.924 µm, NIR1.3=1.365 - 1.395 µm, NIR1.6=1.585 - 1.635 µm, NIR2.2=2.225 - 2.275 µm, IR3.8=3.6 - 4 µm, WV6.3=5.8 - 6.8 µm, WV7.3=7.1 - 7.6 µm, IR8.7=8.5 - 8.9 µm, IR9.7=9.51 - 9.81 µm, IR10.5=10.15 - 10.85 µm, IR12.3=12.05 - 12.55 µm, IR13.3=13 - 13.6 µm (measured at FWHM) Spatial resolution: VIS0.4=1.0 km, VIS0.5=1.0 km, VIS0.6=1.0 km & 0.5 km, VIS0.8=1.0 km, VIS0.9=1.0 km, NIR1.3=1.0 km, NIR1.6=1.0 km, NIR2.2=1.0 km & 0.5 km, IR3.8=2.0 km & 1.0 km, WV6.3=2.0 km, WV7.3=2.0 km, IR8.7=2.0 km, IR9.7=2.0 km, IR10.5=2.0 km & 1.0 km, IR12.3=2.0 km, IR13.3=2.0 km (spatial sampling distance at SSP) Swath width: 210 km swath moved alternately W-E and E-W, moving up S-N a swath width at the end of each swath. Full Disc Coverage (FDC) or Local Area Coverage (LAC) possible. Accuracy: Cloud cover: 10%, Cloud top height: 1 km, Cloud top temperature: 1 K, Cloud type: 8 classes, Surface temperature: 0.7-2.0K, Specific humidity profile: 10%, Wind profile (horizontal component): 2 - 10 m/s, Long wave Earth surface radiation: 5 W/m2
GAMI Greenhouse Gases monitoring Instrument CAST (NSMC-CMA)	FY-3D, FY-3F	TBD	Atmospheric chemistry	Measures greenhouse gases.	Waveband: Spatial resolution: Swath width: Accuracy:
GAP GPS receiver-based Attitude, Position, and profiling experiment (GAP) CSA	ePOP on CASSIOPE	Operational	Space environment	Used for spacecraft position and attitude determination and for ionospheric radio occultation profiling measurements in which the relative phase delay of the measured L1 and L2 signals (at frequencies of 1.57542 GHz and 1.2276 GHz, respectively) from different satellites of the GPS constellation will be used to determine the electron density profile of the ionosphere using tomographic techniques. The GAP is turned on an average of 10% of the time, following a schedule devised by the science team.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
GEDI Global Ecosystem Dynamics Investigation Lidar NASA	GEDI-on-ISS	Being developed	Lidars	This project will use a laser-based system to study a range of climates, including the observation of the forest canopy structure over the tropics, and the tundra in high northern latitudes.	Waveband: Spatial resolution: Swath width: Accuracy:
GEMS Geostationary Environmental Monitoring Spectrometer KARI	GEO-KOMPSAT-2B	Being developed	Atmospheric chemistry	Measurements of atmospheric chemistry, precursors of aerosols and ozone in particular, in high temporal and spatial resolution over Asia.	Waveband: 0.30 µm - 0.50µm Spatial resolution: 56km2 at Seoul Swath width: TBD Accuracy:
GeoSTAR MW Array Spectrometer (PATH) NASA	PATH	Proposed	Imaging multi-spectral radiometers (passive microwave)	High frequency, all-weather temperature and humidity soundings for weather forecasting and SST.	Waveband: 50 - 57 GHz, 165 - 183 GHz, and possibly 118 - 125 GHz Spatial resolution: Temporal resolution is 15 to 30 minutes; 25 - 50 km at nadir Swath width: Temporal resolution is 15 to 30 minutes; 25 - 50 km at nadir Accuracy: <.5 K (brightness temperature)
Geoton-L1 (1) Geoton-L1 ROSKOSMOS (ROSHYDROMET)	Resurs DK 1	Operational	High resolution optical imagers	Multispectral images of land surfaces and Oseans.	Waveband: 0.58 - 0.8 µm; 0.5 - 0.6 µm; 0.6 - 0.7 µm; 0.7 - 0.8 µm Spatial resolution: 3 m; 5 m Swath width: Accuracy:
Geoton-L1 (2) Geoton-L1 ROSKOSMOS	Resurs-P N1, Resurs-P N2, Resurs-P N3	Operational	High resolution optical imagers	Multispectral images of land surfaces and Oceans.	Waveband: 0.58 - 0.8 µm; 0.45 - 0.52 µm; 0.52 - 0.60 µm; 0.61 - 0.68 µm; 0.72 - 0.80 µm; 0.80 - 0.90 µm Spatial resolution: 1 m; 3 m Swath width: Accuracy:
GERB Geostationary Earth Radiation Budget EUMETSAT (ESA)	Meteosat-10, Meteosat-11, Meteosat-8, Meteosat-9	Operational	Earth radiation budget radiometers	Measures long and short wave radiation emitted and reflected from the Earth's surface, clouds and top of atmosphere. Full Earth disk, all channels in 5 minutes.	Waveband: SW: 0.32 - 4.0 µm, LW 4.0 - 30 µm (by subtraction) Spatial resolution: 44.6 x 39.3 km Swath width: Single column moved alternately W-E and E-W to cover the complete earth disc Accuracy: SW=1.2 Wm-2, LW=7.5 Wm-2
GGAK-E Module for Geophysical Measurements ROSKOSMOS (ROSHYDROMET)	Elektro-L N1, Elektro-L N2, Elektro-L N3	Operational	Space environment and magnetic field	Monitoring and forecasting of solar activity, radiation and magnetic field in the near-Earth space, monitoring of natural and modified magnetosphere, ionosphere and upper atmosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
GGAK-M Module for Geophysical Measurements (SEM) ROSKOSMOS (ROSHYDROMET)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Space environment and magnetic field	Space Environmental Monitoring (SEM), heliogeophysical.	Waveband: Spatial resolution: Swath width: Accuracy:
GGAK-VE Module for Geophysical Measurements ROSKOSMOS	Arctic-M N1, Arctic-M N2	Approved	Space environment	Monitoring and forecasting of solar activity, radiation and magnetic field in the near-Earth space, monitoring of natural and modified magnetosphere, ionosphere and upper atmosphere.	Waveband: Spatial resolution: Swath width: Accuracy:

GLM GEO Lightning Mapper NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Lightning sensors	Detect total lightning flash rate over near full disk.	Waveband: NIR at 777.4 nm Spatial resolution: 10 km Swath width: Accuracy: 70%
GMI GPM Microwave Imager NASA	GPM Core	Operational	Imaging multi-spectral radiometers (passive microwave)	Measures rainfall rates over oceans and land, combined rainfall structure and surface rainfall rates with associated latent heating. Used to produce three hour, daily, and monthly total rainfall maps over oceans and land.	Waveband: Microwave: 10.65 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, 89.0 GHz, 165.5 GHz, 183.31 ± 3 GHz, 183.31 ± 8 GHz Spatial resolution: Horizontal: 36 km cross-track at 10.65 GHz (required - Primary Spacecraft, goal - Constellation Spacecraft); 10 km along-track and cross-track (goal - Primary Spacecraft) Swath width: 800 km (Core Observatory Accuracy: 0.65 - 1.5 K
GNOS GNSS Occultation Sounder CAST (NSMC-CMA)	FY-3D, FY-3E, FY-3F, FY-3G	Approved	Atmospheric temperature and humidity sounders	Atmospheric sounding for weather forecasting.	Waveband: Spatial resolution: Swath width: Accuracy:
GNSS POD Receiver ESA	Sentinel-6 A, Sentinel-6 B	Being developed			Waveband: Spatial resolution: Swath width: Accuracy:
GOCI Geostationary Ocean Colour Imager KARI	COMS	Operational	Ocean colour instruments	Ocean colour information, coastal zone monitoring, land resources monitoring.	Waveband: VIS - NIR: 0.40 - 0.88 µm (8 channels) Spatial resolution: 236 x 500 m Swath width: 1440 km Accuracy:
GOES Comms Communications package on GOES NOAA	GOES-13, GOES-14, GOES-15	Operational	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
GOME-2 Global Ozone Monitoring Experiment - 2 EUMETSAT (ESA)	Metop-A, Metop-B, Metop-C	Operational	Atmospheric chemistry	Measurement of total column amounts and stratospheric and tropospheric profiles of ozone. Also amounts of H20, NO2, OClO, BrO, SO2 and HCHO.	Waveband: UV - NIR: 0.24 - 0.79 µm (resolution 0.2 - 0.4 nm) Spatial resolution: Horizontal: 40 x 40 km (960 km swath) to 40 x 5 km (for polarization monitoring) Swath width: 120 - 960 km Accuracy: Cloud top height: 1 km (rms), Outgoing short wave radiation and solar irradiance: 5 W/m2, Trace gas profile: 10 - 20%, Specific humidity profile: 10 - 50 g/kg
GOX Global Positioning Satellite Occultation Experiment (GOX) NASA, NSPO (JPL)	COSMIC-1/FORMOSAT-3 FM1, COSMIC-2/FORMOSAT-3 FM2, COSMIC-4/FORMOSAT-3 FM4, COSMIC-5/FORMOSAT-3 FM5, COSMIC-6/FORMOSAT-3 FM6	Operational	Atmospheric temperature and humidity sounders	Each instrument equipped with 4 GPS antennas to receive the L1 and L2 radio wave signals transmitted from the 24 US GPS satellites. Based on the signal transmission delay caused by the electric density, temperature, pressure, and water content in the ionosphere and atmosphere, information about ionosphere and atmosphere can be derived.	Waveband: L1/L2 Spatial resolution: Vertical: 0.3 - 1.5 m; Horizontal: 300 - 600 km Swath width: Accuracy:
GPS Receiver (Swarm) ESA	Swarm	Operational	Precision orbit	Provides position and timing determination	Waveband: Spatial resolution: L1 C/A code range error better than 0.5 m RMS; L1/L2 P-code range error better than 0.25 m RMS; L1 carrier phase error better than 5 mm Swath width: Accuracy:
GPSP Global Positioning System Payload NASA	Jason-3, OSTM (Jason-2), SWOT	Operational	Precision orbit	Precision orbit determination.	Waveband: Spatial resolution: Swath width: Accuracy:
GPSRO (Oersted) GPS Radio Occultation System NASA	Ørsted (Oersted)	Operational	Atmospheric temperature and humidity sounders	Measurements of atmospheric temperature, pressure and water vapour content.	Waveband: Spatial resolution: Swath width: Accuracy:
GPSRO (Terra-SAR) GPS Radio Occultation System NASA	TerraSAR-X	Operational	Atmospheric temperature and humidity sounders	Measurements of atmospheric temperature, pressure and water vapour content.	Waveband: Spatial resolution: Swath width: Accuracy:
GRACE instrument NASA (DLR)	GRACE, GRACE FO, GRACE-II	Operational	Gravity instruments	Includes BlackJack Global Positioning System (Turbo Rogue Space Receiver) and High Accuracy Inter-satellite Ranging System (aka K-band Ranging System) for Inter-satellite ranging system estimates for global models of the mean and time variable Earth gravity field.	Waveband: Microwave: 24 GHz and 32 GHz Spatial resolution: 400 km horizontal, N/A vertical Swath width: N/A Accuracy: 1 cm equivilant water
GRAS GNSS Receiver for Atmospheric Sounding EUMETSAT (ESA)	Metop-A, Metop-B, Metop-C	Operational	Atmospheric temperature and humidity sounders and precision orbit	GNSS receiver for atmospheric temperature and humidity profile sounding.	Waveband: L-Band Spatial resolution: Vertical: 150 m (troposphere) and 1.5 km (stratosphere), Horizontal: 100 km approx (troposphere), 300 km approx (stratosphere) Swath width: Altitude range of 5 - 30 km Accuracy: Temperature sounding to 1 K rms
GSA (1) Hyperspectral imaging equipment ROSKOSMOS	Resurs-P N1, Resurs-P N2, Resurs-P N3	Operational	Other	Land surface monitoring	Waveband: 0.4 - 1.1 µm, 96 spectral bands Spatial resolution: Swath width: Accuracy:
GSA (2) Hyperspectral imaging equipment ROSKOSMOS	Obzor-O N1, Obzor-O N2	Prototype	Other	Land surface monitoring	Waveband: 0.4 - 1.1 µm Spatial resolution: Swath width: Accuracy:
HDWL (3D Winds) NASA	3D Winds	Proposed	Lidars	Tropospheric winds for weather forecasting and pollution transport.	Waveband: 2.051 µm and 0.355 µm Spatial resolution: 300 km along track horizontal resolution Swath width: View 45 degrees of nadir at four azimuth angles: 45, 135, 225, 315 deg. Accuracy: 2-3 m/s LOS wind accuracy projected into horizontal from all effects including sampling error
Himawari Comms Communications package for Himawari JMA	Himawari-8, Himawari-9	Being developed	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
Himawari DCS Data Collection System for Himawari JMA	Himawari-8, Himawari-9	Being developed	Data collection		Waveband: Spatial resolution: Swath width: Accuracy:
HiRDLS High Resolution Dynamics Limb Sounder NASA (UKSA)	Aqua, Aura	Operational	Atmospheric chemistry	Measures atmospheric temperature, concentrations of ozone, water vapour, methane, NOx, N2O, CFCs and other minor species, aerosol concentration, location of polar stratospheric clouds and cloud tops. Currently not collecting data on Aqua.	Waveband: TIR: 6.12 - 17.76 µm (21 channels) Spatial resolution: Vertical: 1 km, Horizontal: 10 km Swath width: Accuracy: Trace gas: 10%, Temperature: 1 K, Ozone: 10%
HiRI High-Resolution Imager CNES	Pleiades 1A, Pleiades 1B	Operational	High resolution optical imagers	Cartography, land use, risk, agriculture and forestry, civil planning and mapping, digital terrain models, defence.	Waveband: 4 bands + PAN: Near IR (0.77 - 0.91 µm), Red (0.61 - 0.71 µm), Green (0.50 - 0.60 µm), Blue (0.44 - 0.54 µm), Pan (0.47 - 0.84 µm) Spatial resolution: 0.70 m Swath width: 20 km swath at nadir. Agile platform giving ±50 deg off-track Accuracy:
HIRS/3 High Resolution Infra-red Sounder/3 NOAA	NOAA-15	Operational	Atmospheric temperature and humidity sounders	Atmospheric temperature profiles and data on cloud parameters, humidity soundings, water vapour, total ozone content, and surface temperatures.	Waveband: VIS - TIR: 0.69 - 14.95 µm (20 channels) Spatial resolution: 20.3 km Swath width: 2240 km Accuracy:
HIRS/4 High Resolution Infra-red Sounder/4 NOAA	Metop-A, Metop-B, NOAA-18, NOAA-19	Operational	Atmospheric temperature and humidity sounders	Atmospheric temperature profiles and data on cloud parameters, humidity soundings, water vapour, total ozone content, and surface temperatures. Same as HIRS/3, with 10 km IFOV.	Waveband: VIS - TIR: 0.69 - 14.95 µm (20 channels) Spatial resolution: 20.3 km Swath width: 2240 km Accuracy:

HRG CNES	SPOT-5	Operational	High resolution optical imagers	High resolution multispectral mapper. 2 HRG instruments on this mission can be processed to produce simulated imagery of 2.5 m. Images are 60 x 60 km in size.	Waveband: VIS: B1: 0.50 - 0.59 µm, B2: 0.61 - 0.68 µm, NIR: B3: 0.79 - 0.89 µm, SWIR: 1.50 - 1.75 µm, Panchromatic: 0.49 - 0.69 µm Spatial resolution: Panchromatic: 5 m, Multispectral: 10 m Swath width: 60 km (1 instrument), 117 km (2 instruments). Same as SPOT 4 with off-track steering capability (±27 deg) Accuracy:
HRMX High Resolution Multi Spectral ISRO	CARTOSAT-2E	Proposed	Imaging multi-spectral radiometers (vis/IR)	For crops and vegetation dynamics, natural resources census, disaster management and large scale mapping of themes.	Waveband: 4 bands MX in VIS and NIR Spatial resolution: 0.65 m / 2 m Swath width: 10 km Accuracy:
HRMX-TIR High resoultion Mx TIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring of the earth and natural resources applications in hyperspectral thermal bands	Waveband: MX (3 Bands TIR) Spatial resolution: 1.5 km Swath width: Accuracy:
HRMX-VNIR High Resolution MX-VNIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring of the earth and natural resources applications in Visible and VNIR bands	Waveband: MX (4 Bands VNIR) Spatial resolution: 50 m Swath width: Accuracy:
HRS High Resolution Stereoscope CNES	SPOT-5	Operational	High resolution optical imagers	High resolution stereo instrument.	Waveband: Panchromatic: VIS 0.49 - 0.69 µm Spatial resolution: Panchromatic: 10 m, Altitude: 15 m Swath width: 120 km Accuracy:
HRTPC High Resolution Technological Panchromatic Camera CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Proposed	High resolution optical imagers	High Resolution Panchromatic Camera - Technological objective - Coastal development mapping	Waveband: VIS - NIR: 400 - 900 nm Spatial resolution: 5m Swath width: 30 km Accuracy:
HRWS X-Band Digital Beamforming SAR DLR	HRWS SAR	Proposed	Imaging microwave radars	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: 9.65 GHz, up to 1200 MHz bandwidth, fully polarimetric Spatial resolution: VHR Mode: 0.25 x 0.5 m, HR Stripmap: 0,5 x 0,5 m, Stripmap: 1 x 1 m ScanSAR: 4 - 25 x 25 m Swath width: HR Mode: 10 km, HR Stripmap: 20 km Stripmap: 70 km, ScanSAR: up to 800 km Accuracy:
HSC (SABIA_MAR) High Sensitivity Camera CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Proposed	Imaging multi-spectral radiometers (vis/IR)	High Sensitivity Camera (HSC) measures top of atmosphere radiance in the VIS spectral range measured by a high sensitivity sensor detects: urban lights, electric storms, polar regions, snow cover, forest fires, sea surveillance.	Waveband: PAN (VIS-NIR): 450 - 900 nm Spatial resolution: 400 m Swath width: 1560 km Accuracy:
HSC (SAC-D/Aquarius) High Sensitivity Camera CONAE	SAC-D/Aquarius	Operational	Imaging multi-spectral radiometers (vis/IR)	High Sensitivity Camera (HSC) measures top of atmosphere radiance in the VIS spectral range measured by a high sensitivity sensor detects: urban lights, electric storms, polar regions, snow cover, forest fires, sea surveillance.	Waveband: PAN (VIR-NIR): 450 - 900 nm Spatial resolution: 200 - 300 m Swath width: 1600 km Accuracy:
HSI Hyperspectral Imager DLR	EnMAP	Approved	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)	Detailed monitoring and characterization of rock and soil targets, vegetation, inland and coastal waters on a global scale.	Waveband: 420 - 2450 nm Spatial resolution: GSD 30 m Swath width: 30 km Accuracy: Radiometric: <5%
HSI (HJ-1A) Hyper Spectrum Imager CAST	HJ-1A	Operational	Imaging multi-spectral radiometers (vis/IR)	Hyperspectral measurements for environment and disaster management operations.	Waveband: 0.45 - 0.95 µm (128 bands) Spatial resolution: 100 m Swath width: 50 km Accuracy:
HYC HYperspectral Camera ASI	PRISMA	Approved	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)	Hyperspectral data for complex land ecosystem studies.	Waveband: VNIR: 400 - 1010 nm, SWIR: 920 - 2500 nm Spatial resolution: 30 m Swath width: 30 km Accuracy: Spectral resolution 10 nm
Hyperion Hyperspectral Imager NASA	NMP EO-1	Operational	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)	Hyperspectral imaging of land surfaces.	Waveband: VIS - NIR: 400 - 1000 nm; NIR - SWIR: 900 - 2500 nm; 10 nm spectral resolution for 220 bands Spatial resolution: 30 m Swath width: 185 km Accuracy: SNR @ 10% refl target: vis 10-40 swir 10-20
HYSI (Cartosat-3) Hyperspectral sensor ISRO	CARTOSAT-3	Being developed	High resolution optical imagers	High resolution images for study of agriculture, geology and water resources for generation of spectral library, geological mapping, water quality assessment, precision agriculture, discrimination of vegetation types, coastal studies, oil and mineral exploration etc	Waveband: VNIR 0.4 - 0.9 (50 bands); SWIR 0.9-2.4 µm (150 bands) Spatial resolution: 12 m Swath width: 15 km Accuracy:
HYSI-SWIR Hyperspectral SWIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring of the earth and natural resources applications in hyperspectral SWIR bands	Waveband: 60 Bands VNIR Spatial resolution: 320 m Swath width: Accuracy:
HYSI-VNIR Hyperspectral VNIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring of the earth and natural resources applications in hyperspectral VNIR bands	Waveband: 150 Bands SWIR Spatial resolution: 192 m Swath width: Accuracy:
IASI Infrared Atmospheric Sounding Interferometer CNES (EUMETSAT)	Metop-A, Metop-B, Metop-C	Operational	Atmospheric temperature and humidity sounders and atmospheric chemistry	Measures tropospheric moisture and temperature, column integrated contents of ozone, carbon monoxide, methane, dinitrogen oxide and other minor gases which affect tropospheric chemistry. Also measures sea surface and land temperature.	Waveband: MWIR - TIR: 645 to 2760 cm-1 or 3.4 - 15.5 µm (8461 channels) Spatial resolution: Vertical: 1 - 30 km, Horizontal: 25 km Swath width: 2052 km Accuracy: Temperature: 0.5 - 2 K, specific humidity: 0.1 - 0.3 g/kg, ozone, trace gas profile: 10%
IASI-NG Infrared Atmospheric Sounding Interferometer - New Generation CNES (EUMETSAT)	EPS-SG-a	Proposed	Atmospheric temperature and humidity sounders	Measures tropospheric moisture and temperature, column integrated contents of ozone, carbon monoxide, methane, dinitrogen oxide and other minor gases which affect tropospheric chemistry. Also measures sea surface and land temperature.	Waveband: MWIR - TIR: 645 to 2760 cm-1 or 3.4 - 15.5 µm (16921 channels) Spatial resolution: Vertical: 1 - 30 km, Horizontal: 25 km Swath width: 2052 km Accuracy: TBC
ICI Ice Cloud Imager EUMETSAT (ESA)	EPS-SG-b	Proposed	Imaging multi-spectral radiometers (passive microwave)	Measures cloud ice content, snowfall detection, precipitation content, snowfall rate near surface and water vapour profiles	Waveband: 11 channels from 183 to 664 GHz Spatial resolution: Footprint size 15 km (Threshhold) Swath width: Accuracy:
IIR Imaging Infrared Radiometer CNES	CALIPSO	Operational	Imaging multi-spectral radiometers (vis/IR)	Radiometer optimised for combined IIR/lidar retrievals of cirrus particle size.	Waveband: TIR: 8.7 µm, 10.5 µm, and 12.0 µm (0.8 µm resolution) Spatial resolution: 1 km Swath width: 64 km Accuracy: 1 K
IK-radiometer (1) IR-radiometer ROSKOSMOS	Obzor-O N1, Obzor-O N2	Proposed	Imaging multi-spectral radiometers (vis/IR)	Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection.	Waveband: Spatial resolution: Swath width: Accuracy:
IKFS IR-Fourier spectrometer ROSKOSMOS (ROSHYDROMET)	Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Atmospheric temperature and humidity sounders	Atmospheric temperature/humidity profiles, data on cloud parameters, water vapour & ozone column amounts, surface temperature.	Waveband: 5 - 15 µm, more then 5000 spectral channels Spatial resolution: 35 -100 km, spectral resolution ~0.5 cm-1 Swath width: 1000/2000 km Accuracy: 0.5 K
Imager NOAA	GOES-13, GOES-14, GOES-15	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, atmospheric radiance, winds, atmospheric stability, rainfall estimates. Used to provide severe storm warnings/ monitoring day and night (type, amount, storm features).	Waveband: GOES 8 - 11: VIS: 1 channel (8 detectors), IR: 4 channels: 3.9 µm, 6.7 µm, 10.7 µm and 12 µm, GOES 12 - Q: VIS: 1 channel (8 detectors), IR: 4 channels: 3.9 µm, 6.7 µm, 10.7 µm and 13.3 µm Spatial resolution: 10 km Swath width: Full Earth disk Accuracy:

Imager (INSAT) Very High Resolution Radiometer ISRO	INSAT-3D, INSAT-3DR	Operational	Imaging multi-spectral radiometers (vis/IR)	Cloud cover, severe storm warnings/monitoring day and night (type, amount, storm features), atmospheric radiance winds, atmospheric stability rainfall.	Waveband: VIS: 0.55 - 0.75 µm; SWIR: 1.55 - 1.7 µm; MWIR: 3.80 - 4.00 µm, 6.50 - 7.00 µm; TIR: 10.2 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: 1 x 1 km (VIS and SWIR), 4 x 4 km (MWIR, TIR), 8 x 8 km (in 6.50 - 7.00 µm) Swath width: Full Earth disc and space around, Normal Frame (50 deg. N to 40 deg. S and full E-W coverage), Program Frame (Programmable, E-W Full coverage) Accuracy:
IMAGER/MTSAT-2 Imager/MTSAT JMA	MTSAT-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, cloud motion, cloud height, water vapour, rainfall, sea surface temperature and Earth radiation.	Waveband: VIS - SWIR: 0.55 - 0.80 µm, MWIR - TIR: 3.5 - 4 µm, 6.5 - 7 µm, 10.3 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: Visible: 1 km, TIR: 4 km Swath width: Full Earth disk every hour Accuracy:
IMWAS Improved MicroWave Atmospheric Sounder NRSCC (CAST)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Operational	Atmospheric temperature and humidity sounders	Atmospheric sounding measurements.	Waveband: Microwave: 19.35 - 89.0 GHz (8 channels) Spatial resolution: Swath width: Accuracy:
IPDA LIDAR Integrated Path Differential Absorption Light Detection and Ranging Instrument DLR (CNES)	MERLIN	Proposed	Atmospheric chemistry	'Active' optical remote sensing instrument for atmospheric parameters or trace gases. Global information on atmospheric Methane concentration (Methane column density measurements).	Waveband: Two laser wavelengths, mean wavelength 1645 µm Spatial resolution: 50 km x 0.1 km Swath width: 0.1 km Accuracy: <2%
IR (HJ-1B) Infrared Camera CAST	HJ-1B	Operational	Imaging multi-spectral radiometers (vis/IR)	Infrared measurements for environment and natural disaster monitoring.	Waveband: 0.75 - 1.10 µm, 1.55 - 1.75 µm, 3.50 - 3.90 µm, 10.5 - 12.5 µm Spatial resolution: 300 m (10.5 - 12.5 µm), 150 m (the other bands) Swath width: 720 km Accuracy:
IR Correlation Radiometer (GeoCape) NASA	GEO-CAPE	Proposed	Imaging multi-spectral radiometers (vis/IR)	The near-IR and thermal-IR data will describe vertical CO, an excellent tracer of long-range transport of pollution. Identifying large scale vegetation burning events. Characterizing the oxidizing capacity of the atmosphere.	Waveband: 2.3, 4.6 µm Spatial resolution: 7 km horizontal spatial resolution, 2-3 layers in vertical resolution; < 0.2 um spectral resolution. Swath width: 2-d image of continental domain (north or south America). Accuracy: CO precision: 1 x 10^17 cm^ (-2)
IR Spectrometer(GACM) NASA	GACM	Proposed	Atmospheric chemistry	Daytime column measurements of CO in SWIR at 2.4 µm.	Waveband: 2.4 and 4.6 µm Spatial resolution: Swath width: Accuracy:
IRAS InfraRed Atmospheric Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Atmospheric temperature and humidity sounders	Atmospheric sounding for weather forecasting.	Waveband: VIS - TIR: 0.65 - 14.95 µm (26 channels) Spatial resolution: 14 km Swath width: 952 km Accuracy: 17 km
IRM Imaging and Rapid-Scanning Ion Mass Spectrometer CSA	ePOP on CASSIOPE	Operational	Space environment	Measures the composition and 3-dimensional velocity distributions of ions.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
IRS Infra-Red Sounder EUMETSAT (ESA)	MTG-S1 (sounding), MTG-S2 (sounding)	Being developed	Atmospheric temperature and humidity sounders	Measurements of vertically resolved clear sky atmospheric motion vectors, temperature and water vapour profiles.	Waveband: LWIR: 700 - 1210 cm^-1, MWIR: 1600 - 2175 cm^-1 Spatial resolution: Horizontal: 4 km at SSP, Vertical: 1 km Swath width: 640 x 640 km dwells, step and stare, moving alternatley E-W and W-E moving up S-N one dwell step at the end of each row of dwells. Each disc is divided in 4 areas of Local Area Coverage (LAC). Accuracy: clear sky AMVs: 2 m/s, temperature profile: 1 K, water vapour profile: 5%
IRS Infrared scanner CAST (INPE)	CBERS-4	Operational	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.5 - 0.9 µm; 1.55 - 1.75 µm, 2.08 - 2.35 µm; 10.4 - 12.5 µm Spatial resolution: PAN, SWIR: 40 m, TIR: 80 m Swath width: 120 km Accuracy:
IRS (SJ-9B) Infrared scanner CRESDA	SJ-9B	Operational	Imaging multi-spectral radiometers (passive microwave)		Waveband: 8-12 µm Spatial resolution: 73 m Swath width: 18 km Accuracy:
IVISSR (FY-2) Improved Multispectral Visible and Infra-red Scan Radiometer (5 channels) NRSCC (NSMC-CMA, CAST)	FY-2D, FY-2E, FY-2F	Operational	Imaging multi-spectral radiometers (vis/IR)	Meteorological.	Waveband: VIS - TIR: 0.5 - 12.5 µm (5 channels) Spatial resolution: 5 km Swath width: Full Earth disk Accuracy: 1.25 - 5 km
JAMI/MTSAT-1R Japanese Advanced Meteorological Imager JMA	MTSAT-1R	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, cloud motion, cloud height, water vapour, rainfall, sea surface temperature and Earth radiation.	Waveband: VIS - SWIR: 0.55 - 0.90 µm, MWIR - TIR: 3.5 - 4 µm, 6.5 - 7 µm, 10.3 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: Visible: 1 km, TIR: 4 km Swath width: Full Earth disk every hour Accuracy:
JMR JASON Microwave Radiometer NASA	OSTM (Jason-2)	Operational	Imaging multi-spectral radiometers (passive microwave)	Altimeter data to correct for errors caused by water vapour and cloud-cover. Also measures total water vapour and brightness temperature.	Waveband: Microwave: 18.7 GHz, 23.8 GHz, 34 GHz Spatial resolution: 41.6 km at 18.7 GHz, 36.1 km at 23.8 GHz, 22.9 km at 34 GHz Swath width: 120 deg cone centred on nadir Accuracy: Total water vapour: 0.2 g/sq cm, Brightness temperature: 0.15 K
K band radiometers (SCLP) NASA	SCLP	Proposed	Imaging multi-spectral radiometers (passive microwave)	Snow accumulation for fresh water availability.	Waveband: Spatial resolution: Spatial resolution of 50 to 100 m 15 day temporal resolution Swath width: Accuracy:
Ka-band Radar INterferometer (KaRIN) NASA (CNES)	SWOT	Proposed	Radar altimeters	Swath mapping radar altimeter that provides measurements for surface water.	Waveband: Spatial resolution: Vertical resolution is 2 cm Swath width: Accuracy:
KMSS Multispectral Imager (VIS) system ROSKOSMOS (ROSHYDROMET)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Multispectral images of land & sea surfaces and ice cover.	Waveband: 0.4 - 0.9 µm, 3 cameras with 3 channels each Spatial resolution: 50 m - 100 m Swath width: 900 km Accuracy:
Ku and X-band radars (SCLP) NASA	SCLP	Proposed	Imaging microwave radars	Snow accumulation for fresh water availability.	Waveband: Spatial resolution: Spatial resolution of 50 to 100 m; 15 day temporal resolution Swath width: Accuracy:
L-band Radar (SMAP) L-band Synthetic Aperture Radar (SMAP) NASA	SMAP	Being developed	Imaging microwave radars	High-resolution measurements of radar backscatter for global estimates of surface soil moisture and freeze/thaw states for climate modeling and weather prediction	Waveband: L-Band (1.2 GHz) Spatial resolution: <3 km spatial resolution over 70% of swath; 3 days temporal resolution. Soil moisture will be estimated at a resolution of 10 km and freeze-thaw state at a resolution of 1-3 km. Swath width: 40-deg constant incidence angle across the 1000 km swath Accuracy: <1dB Co-polarization; <1.5 dB cross-polarization at 3 km resolution
L-band Radiometer (SMAP) NASA	SMAP	Being developed	Imaging multi-spectral radiometers (passive microwave)	High-accuracy measurements of brightness temperatures for global estimates of surface soil moisture for climate modeling and weather prediction	Waveband: L-band (1.4 GHz) Spatial resolution: 40km spatial resolution; 3 days temporal resolution Swath width: 40-deg constant incidence angle across the 1000 km swath Accuracy: 1.3K accuracy brightness temperature

L-band SAR (NISAR) L-band Synthetic Aperture Radar (SAR) (NISAR) NASA (ISRO)	NISAR	Proposed	Imaging microwave radars	3-year mission to study solid earth deformation (earthquakes, volcanoes, landslides), changes in ice (glaciers, sea ice) and changes in vegetation biomass	Waveband: L-Band: 1200 -1300 Hz Spatial resolution: At 12-day repeat, global coverage, 10m resolution Swath width: 240 km Accuracy: TBD
Lagrange LABEN GNSS Receiver for Advanced Navigation, Geodesy and Experiments ASI	SAC-D/Aquarius	Operational	Atmospheric temperature and humidity sounders	GPS Receiver including specialised version equipped with limb sounding antenna and dedicated signal tracking capability for meteorological, climate and space weather applications.	Waveband: Spatial resolution: Swath width: Accuracy:
Langmuir Probe NSC	Norsat-1	Proposed			Waveband: Spatial resolution: Swath width: Accuracy:
Laser altimeter (LIST) NASA	LIST	Proposed	Lidars	New technology laser system that performs spatial mapping of Earth's surface from an orbital platform.	Waveband: Planned: 1030um Spatial resolution: Swath width: Accuracy:
Laser Reflectors CNES	STARLETTE, STELLA	Operational	Precision orbit	Measures distance between the satellite and the laser tracking stations.	Waveband: Spatial resolution: Swath width: Accuracy:
Laser Reflectors (ESA) Laser Reflectors ESA	CryoSat-2, Swarm	Operational	Precision orbit	Measures distance between the satellite and the laser tracking stations.	Waveband: Spatial resolution: Swath width: Accuracy:
LCCRA Laser Corner Cube Reflector Assembly ASI	LARES	Operational	Precision orbit	Accuracy measurements on Lense-Thirring effect and baseline tracking data for General Relativity study and precision geodesy. Also for calibration of radar altimeter bias.	Waveband: VIS: 400 - 750 nm Spatial resolution: N/A Swath width: N/A Accuracy: 2 cm overhead ranging
LEISA AC LEISA Atmospheric Corrector NASA	NMP EO-1	Operational	Imaging multi-spectral radiometers (vis/IR)	Corrects high spatial resolution multispectral imager data for atmospheric effects.	Waveband: 256 bands, NIR - SWIR: 0.89 - 1.58 µm Spatial resolution: 250 m Swath width: 185 km Accuracy:
LI Lightning Imager EUMETSAT (ESA)	MTG-I1 (imaging), MTG-I2 (imaging), MTG-I3 (imaging), MTG-I4 (imaging)	Being developed	Lightning sensors	Real time lightning detection (cloud-to-cloud and cloud-to-ground strokes, with no discrimination between the two), lightning location.	Waveband: NIR neutral oxygen lightning emission features at 777.4 nm Spatial resolution: < 10 km at 45°N Swath width: Fixed view of 80% of visible earth disc, all EUMETSAT member states Accuracy: Detection Efficiency: 90% at 45N, SSP longitude, 70% on average over the area of coverage (for lightning signals 6.7 mWm-2sr-1 during the night, 16.7 mWm-2sr-1 during the day), Radiance accuracy: 10% for radiances higher than 70 mWm-2sr-1, 7 mWm-2sr-1 for radiances lower than 70 mWm-2sr-1
Lidar NASA	ACE	Proposed	Lidars	Measurement of aerosol heights, cloud top heights and aerosol properties.	Waveband: 532 nm (polarization-sensitive), 1064 nm, 355 nm Spatial resolution: Vertical sampling: 30 - 60 m, -2 to 40 km Swath width: 333 m along-track Accuracy:
LIS Lightning Imaging Sensor NASA	TRMM	Operational	Lightning sensors	Global distribution and variability of total lightning. Data can be related to rainfall to study hydrological cycle.	Waveband: NIR: 0.7774 µm Spatial resolution: 4 km Swath width: FOV: 80 x 80 deg Accuracy: 90% day and night detection probability
LISS-III (Resourcesat) Linear Imaging Self Scanner - III (Resourcesat) ISRO	RESOURCESAT-2, RESOURCESAT-2A	Operational	High resolution optical imagers	Data used for vegetation type assessment, resource assessment, crop stress detection, crop production forecasting, forestry, land use and land cover change.	Waveband: VIS: Band 2: 0.52 - 0.59 µm, Band 3: 0.62 - 0.68 µm, NIR: Band 4: 0.77 - 0.86 µm, SWIR: Band 5: 1.55 - 1.75 µm Spatial resolution: 23.5 m Swath width: 141 km Accuracy:
LISS-IV Linear Imaging Self Scanner - IV ISRO	RESOURCESAT-2, RESOURCESAT-2A	Operational	High resolution optical imagers	Vegetation monitoring, improved crop discrimination, crop yield, disaster monitoring and rapid assessment of natural resources.	Waveband: VIS: 0.52 - 0.59 µm, 0.62 - 0.68 µm, NIR: 0.77 - 0.86 µm Spatial resolution: 5.8 m Swath width: 70 km Accuracy:
LM Lightning Mapper NRSCC (NSMC-CMA, CAST)	FY-4A, FY-4B, FY-4C, FY-4D, FY-4E	Approved	Lightning sensors	Lightning mapping for locating thunder storms in flooding season, CCD camera operating 0.77 µm to count flashes and intensity.	Waveband: 0.774 µm Spatial resolution: 10 km Swath width: Full Earth disk Accuracy: 8 km
LOTUSat 1 SAR VAST	LOTUSat 1	Proposed	Imaging microwave radars	The LOTUSat 1 SAR instrument is designed for land cover measurements and applications.	Waveband: X-band SAR. Spatial resolution: Swath width: Accuracy:
LOTUSat 2 SAR VAST	LOTUSat 2	Proposed	Imaging microwave radars	The LOTUSat 2 SAR instrument is designed for land cover measurements and applications.	Waveband: X-band SAR. Spatial resolution: Swath width: Accuracy:
LRA Laser Retroreflector Array NASA (ASI)	Jason-3, OSTM (Jason-2), SWOT	Operational	Precision orbit	Baseline tracking data for precision orbit determination and/or geodesy. Also for calibration of radar altimeter bias. Several types used on various missions. (ASI involved in LAGEOS 2 development).	Waveband: Spatial resolution: Swath width: Accuracy: 2 cm overhead ranging
LRA (LAGEOS) Laser Retroreflector Array ASI	LAGEOS-1, LAGEOS-2	Operational	Precision orbit	Baseline tracking data for precision geodesy. Also for calibration of radar altimeter bias. Several types used on various missions.	Waveband: VIS: 400 - 750 nm Spatial resolution: N/A Swath width: N/A Accuracy: 2 cm overhead ranging
LRA (Sentinel-6) Laser Retroreflector Array (Sentinel-6) NOAA (ESA, NASA)	Sentinel-6 A, Sentinel-6 B	Being developed	Precision orbit		Waveband: Spatial resolution: Swath width: Accuracy:
LRI Laser Ranging Instrument NASA	GRACE FO	Being developed	Gravity instruments		Waveband: Spatial resolution: Swath width: Accuracy:
LRIT Low-Rate Information Transmission NOAA	GOES-13, GOES-14, GOES-15, NOAA-19	Operational	Communications	Follow-on from the Weather Facsimile (WEFAX) Processing System.	Waveband: Spatial resolution: Swath width: Accuracy:
MAC Multi-Angle Multispectral Camera CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Proposed	Imaging multi-spectral radiometers (vis/IR)	Ocean Colour - Multi-angle viewing for atmospheric correction purposes for both, open ocean and coastal	Waveband: VIS-NIR 4 bands: 412 - 443 - 555 - 865 nm Spatial resolution: 400m - 800 m Swath width: 1350 km Accuracy:
MADRAS Microwave Analysis and Detection of Rain and Atmospheric Structures ISRO (CNES)	MEGHA-TROPIQUES	Operational	Imaging multi-spectral radiometers (passive microwave)	To estimate rainfall, atmospheric water parameters and ocean surface winds in the equatorial belt.	Waveband: 18.7 GHz, 23.8 GHz, 36.5 GHz, 89 GHz, 157 GHz Spatial resolution: 40 km Swath width: 1700 km Accuracy:
MAESTRO Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation CSA	SCISAT-1	Operational	Atmospheric chemistry	Chemical processes involved in the depletion of the ozone layer.	Waveband: UV - NIR: 0.285 - 1.03 µm (1 - 2 nm spectral resolution) Spatial resolution: Approx 1 - 2 km vertical Swath width: Accuracy:

Magnetometer (NOAA) Magnetometer NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Approved	Magnetic field		Waveband: Spatial resolution: Swath width: Accuracy:
MCSI Multiple Channel Scanning Imager NRSCC (NSMC-CMA, CAST)	FY-4A, FY-4B, FY-4C, FY-4D, FY-4E	Approved	Imaging multi-spectral radiometers (vis/IR)	Multipurpose visible/IR imagery and wind derivation.	Waveband: 12 channels from 0.55 - 13.8 µm Spatial resolution: 1 km VIS, 2 km NIR, 4 km TIR Swath width: Full Earth disk Accuracy: 0.5 - 4.0 km
MERSI Medium Resolution Spectral Imager NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurement of vegetation indexes and ocean colour.	Waveband: 25 channels from 0.47 - 12.0 µm Spatial resolution: 250 m for broadband channels, 1 km for narrowband channels Swath width: 2800 km Accuracy: 0.25 - 1.0 km
MERSI-2 Improved Medium Resolution Spectral Imager NRSCC (NSMC-CMA, CAST)	FY-3D, FY-3E, FY-3F, FY-3G	Approved	Imaging multi-spectral radiometers (vis/IR)	Measurement of vegetation indexes and ocean colour.	Waveband: Spatial resolution: Swath width: Accuracy:
Meteosat Comms Communications package for Meteosat EUMETSAT	Meteosat-7	Operational	Communications	Communication package onboard Meteosat series satellites.	Waveband: Spatial resolution: Swath width: Accuracy:
METImage Multi Spectral Imager EUMETSAT (DLR)	EPS-SG-a	Proposed	Imaging multi-spectral radiometers (vis/IR)	Operational multi spectral imager for meteorological Post-EPS VIS/IR Imaging Mission (VII).	Waveband: UV-TIR (No of Channels and centre wavelengths tbd by EUMETSAT Post-EPS MRD) Spatial resolution: 250 - 500 m (TBD by EUMETSAT Post-EPS MRD) Swath width: 2800 km (+/-55°) (TBD by EUMETSAT Post-EPS MRD) Accuracy:
MGF Fluxgate Magnetometer CSA	ePOP on CASSIOPE	Operational	Magnetic field	The MGF consists of dual, tri-axial fluxgate magnetometers mounted on an 80-cm carbon fibre boom for measurements of magnetic field perturbations to a precision of 0.0625 nanotesla, from which to infer small-scale field-aligned currents. The MGF is turned on an average of 20% of the time, following a schedule devised by the science team.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
MHS Microwave Humidity Sounder EUMETSAT	Metop-A, Metop-B, Metop-C, NOAA-18, NOAA-19	Operational	Atmospheric temperature and humidity sounders	Atmospheric humidity profiles, cloud cover, cloud liquid, water content, ice boundaries and precipitation data.	Waveband: Microwave: 89 GHz, 166 GHz and 3 channels near 183 GHz Spatial resolution: Vertical: 3 - 7 km, Horizontal: 30 - 50 km Swath width: 1650 km Accuracy: Cloud water profile: 10 g/m2, specific humidity profile: 10 - 20%
MI Meteorological Imager KARI	COMS	Operational	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring capability for the near real-time generation of high-resolution meteorological products and long-term change analysis of sea surface temperature and cloud coverage.	Waveband: 1: VIS, 0.55 - 0.80 µm; 2: SWIR: 3.50 - 4.00 µm; 3: WV (Waver Vapour): 6.50 - 7.00 µm; 4: TIR1 (Thermal Infrared 1): 10.3 - 11.3 µm, 5: TIR2 (Thermal Infrared 2): 11.5 - 12.5 µm Spatial resolution: VIS: 1 km, IR: 4 km Swath width: Full Earth disk Accuracy:
Microwave limb sounder (GACM) NASA	GACM	Proposed	Atmospheric chemistry	Limb-viewing measurements of O3, N2O, temperature, water vapour, CO, HNO3, ClO, and volcanic SO2 in the.	Waveband: Spatial resolution: Swath width: Accuracy:
MIRAS Multichannel Infrared Atmospheric Sounder NRSCC (CAST)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Operational	Imaging multi-spectral radiometers (passive microwave)		Waveband: Spatial resolution: Swath width: Accuracy:
MIRAS (SMOS) Microwave Imaging Radiometer using Aperture Synthesis (MIRAS) ESA	SMOS	Operational	Imaging multi-spectral radiometers (passive microwave) and multiple direction/polarisation radiometers	Objective is to demonstrate observations of sea surface salinity and soil moisture in support of climate, meteorology, hydrology, and oceanography applications.	Waveband: L-Band 1.41 GHz Spatial resolution: 33 - 50 km depending on the position in the swath - resampled to 15 km grid Swath width: Hexagon shape, nominal width 1050 km allowing a 3 day revisit time at the equator Accuracy: 2.6 K absolute accuracy, RMS 1.6-4 K depending on the scene and the position within the swath
MIRS Middle IR Scanner NSAU	Sich-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Scanner images of land surface in middle infra-red range.	Waveband: NIR: 1.55 - 1.7 µm Spatial resolution: 41.4 m Swath width: 55.3 km pointable ±35° from nadir Accuracy: 8 bits
MISR Multi-angle Imaging SpectroRadiometer NASA	Terra	Operational	Multiple direction/polarisation radiometers	Measurements of global surface albedo, aerosol and vegetation properties. Also provides multi-angle bidirectional data (1% angle-to-angle accuracy) for cloud cover and reflectances at the surface and aerosol opacities. Global and local modes.	Waveband: VIS: 0.44 µm, 0.56 µm, 0.67 µm, NIR: 0.86 µm Spatial resolution: 275 m, 550 m or 1.1 km, Summation modes available on selected cameras/bands: 1 x 1, 2 x 2, 4 x 4, 1 x 4. 1 pixel = 275 x 275 m Swath width: 380 km common overlap of all 9 cameras Accuracy: 0.03% hemispherical albedo, 10% aerosol opacity, 1-2% angle to angle accuracy in bidirectional reflectance
MLS (EOS-Aura) Microwave Limb Sounder (EOS-Aura) NASA	Aura	Operational	Atmospheric temperature and humidity sounders	Measures lower stratospheric temperature and concentration of H2O, O3, ClO, HCl, OH, HNO3, N2O and SO2.	Waveband: Microwave: 118 GHz, 190 GHz, 240 GHz, 640 GHz and 2.5 THz Spatial resolution: 3 x 300 km horizontal x 1.2 km vertical Swath width: Limb scan 2.5 - 62.5 km Limb to limb Accuracy: Temperature: 4 K, Ozone: 50%
MODIS MODerate-Resolution Imaging Spectroradiometer NASA	Aqua, Terra	Operational	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Data on biological and physical processes on the surface of the Earth and in the lower atmosphere, and on global dynamics. Surface temperatures of land and ocean, chlorophyll fluorescence, land cover measurements, cloud cover (day and night).	Waveband: VIS - TIR: 36 bands in range 0.4 - 14.4 µm Spatial resolution: Cloud cover: 250 m (day) and 1000 m (night), Surface temperature: 1000 m Swath width: 2330 km Accuracy: Long wave radiance: 100 nW/m2, Short wave radiance: 5%, Surface temperature of land: <1 K, Surface temperature of ocean: <0.2 K, Snow and ice cover: 10%
MOPITT Measurements Of Pollution In The Troposphere CSA (NASA)	Terra	Operational	Atmospheric chemistry	Measurements of CO in the troposphere.	Waveband: SWIR-MWIR: 2.3 µm, 2.4 µm and 4.7 µm Spatial resolution: CO profile: 4 km vertical, 22 x 22 km horizontal, CO, CH4 column: 22 x 22 km horizontal Swath width: 616 km Accuracy: Carbon monoxide (4 km layers): 10%
MS (GISTDA) Multi spectral imager GISTDA	THEOS	Operational	Imaging multi-spectral radiometers (vis/IR)	THEOS MS consists of 4 spectral bands (R,G,B, NIR) with resolution 15 m and swath width at 90 km. The applications which are suitable for this instrument such as cartography, land use, land cover change management, agricultural and natural resources management, etc.	Waveband: 0.45 - 0.52 µm, 0.53 - 0.60 µm, 0.62 - 0.69 µm, 0.77 - 0.90 µm Spatial resolution: 15 m Swath width: 90 km Accuracy: GSD for MS = 15 m +/- 10% MTF for MS > 0.12 in each band
MSA (1) Multispectral imaging equipment ROSKOSMOS	Obzor-O N1, Obzor-O N2	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: Spatial resolution: Swath width: Accuracy:
MSA (2) Multispectral imaging equipment ROSKOSMOS	Obzor-O N3, Obzor-O N4	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: Spatial resolution: Swath width: Accuracy:
MSC Multi-Spectral Camera KARI	KOMPSAT-2	Operational	High resolution optical imagers	High resolution imager for land applications of cartography and disaster monitoring.	Waveband: Panchromatic VIS: 0.50 - 0.90 µm, VIS: 0.45 - 0.52 µm, 0.52 - 0.60 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: Pan: 1 m; VNIR: 4 m Swath width: 15 km Accuracy:
MSG Comms Communications package for MSG EUMETSAT	Meteosat-10, Meteosat-11, Meteosat-8, Meteosat-9	Operational	Communications	Communication package onboard MSG series satellites.	Waveband: Spatial resolution: Swath width: Accuracy:

MSI Multi Spectral Imager DLR	RapidEye	Operational	High resolution optical imagers	High resolution images with short observing cycle for commercial and scientific applications.	Waveband: 4 VIS + 1 NIR band: 440 - 510 nm, 520 - 590 nm, 630 - 685 nm, 690 - 730 nm, 760 - 850 nm Spatial resolution: 6.5 m Swath width: 78 km Accuracy: 2 - 3%
MSI (EarthCARE) Multi-Spectral Imager (EarthCARE) ESA	EarthCARE	Approved	Imaging multi-spectral radiometers (vis/IR)	Observation of cloud properties and aerosol (aerosols to be confirmed).	Waveband: VIS - NIR: Band1: VIS, 670 nm, Band2: NIR, 865 nm, Band3: SWIR-1, 1.67 µm, Band4: SWIR-2, 2.21 µm, Thermal Infrared: Band5: 8.8 µm, Band6: 10.8µm, Band7: 12.0 µm Spatial resolution: 500 x 500 m Swath width: 150 km swatch with, asymmetrically; 35 km to 115 km versus nadir point Accuracy:
MSI (Sentinel-2) Multi-Spectral Instrument (Sentinel-2) ESA (EC)	Sentinel-2 A, Sentinel-2 B, Sentinel-2 C	Being developed	High resolution optical imagers	Optical high spatial resolution imagery over land and coastal areas for GMES operational services.	Waveband: 13 bands in the VNIR-SWIR Spatial resolution: 10 m for 4 bands in VNIR, 60 m for 3 dedicated atmospheric correction bands, 20 m for remaining bands Swath width: 290 km Accuracy: Absolute radiometric accuracy for Level 1C data: 3 - 5%
MSS Multispectral imaging system ROSKOSMOS (ROSHYDROMET)	Kanopus-V, Kanopus-V-IR	Operational	High resolution optical imagers	Multispectral images of land & sea surfaces and ice cover.	Waveband: 0.5 - 0.6 µm; 0.6 - 0.7 µm; 0.7 - 0.8 µm; 0.8 - 0.9 µm Spatial resolution: 12 m Swath width: 20 km Accuracy:
MSS (Sich) Multispectral Scanner NSAU	Sich-2	Operational	High resolution optical imagers	Multispectral scanner images of land surface.	Waveband: VIS - NIR: 0.51 - 0.90 µm; VIS: 0.51 - 0.59 µm, 0.61 - 0.68 µm; NIR: 0.80 - 0.89 µm Spatial resolution: 8.2 m Swath width: 46.6 km pointable ±35° from nadir Accuracy: 8 bits
MSU-GS Multispectral scanning imager-radiometer ROSKOSMOS (ROSHYDROMET)	Elektro-L N1, Elektro-L N2, Elektro-L N3	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurements of cloud cover, cloud top height, precipitation, cloud motion, albedo, vegetation, convection, air mass analysis, tropopause monitoring, stability monitoring, total ozone and surface temperature, fire detection.	Waveband: VIS: 0.5 - 0.65 µm, 0.65 - 0.8 µm (broadband), NIR: 0.9 µm, MWIR: 3.5 - 4.01 µm, TIR: 5.7 - 7.0 µm, 8 µm, 8.7 µm, 9.7 µm, 10.2 - 11.2 µm, 11.2 - 12.5 µm Spatial resolution: 1 km for VIS and 4 km for IR channels Swath width: Full Earth disk Accuracy: VIS: 5%; IR: 0.35 K
MSU-GS/VE Multispectral scanning imager-radiometer ROSKOSMOS	Arctic-M N1, Arctic-M N2	Approved	Imaging multi-spectral radiometers (vis/IR)		Waveband: Spatial resolution: Swath width: Accuracy:
MSU-IK-SR Multi-channel medium and far IR range radiometer ROSKOSMOS (ROSHYDROMET)	Kanopus-V-IR	Proposed	Imaging multi-spectral radiometers (vis/IR)	Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection.	Waveband: Spatial resolution: Swath width: Accuracy:
MSU-MR Low-resolution multispectral scanning imager-radiometer ROSKOSMOS (ROSHYDROMET)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection.	Waveband: VIS: 0.5 - 0.7 µm; NIR: 0.7 - 1.1 µm; SWIR: 1.6 - 1.8 µm; MWIR: 3.5 - 4.1 µm; TIR: 10.5 - 11.5 µm, 11.5 - 12.5 µm Spatial resolution: 1000 m Swath width: 2800 km Accuracy: VIS: 0.5%; IR: 0.1 - 0.2 K
MTSAT Comms Communications package for MTSAT JMA	MTSAT-1R, MTSAT-2	Operational	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
MTSAT DCS Data Collection System for MTSAT JMA	MTSAT-1R, MTSAT-2	Operational	Data collection		Waveband: Spatial resolution: Swath width: Accuracy:
MTVZA Scanning microwave imager-sounder ROSKOSMOS (ROSHYDROMET)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Imaging multi-spectral radiometers (passive microwave)	Atmospheric temperature and humidity profiles, precipitation, sea-level wind speed, snow/ice coverage.	Waveband: 18.7 - 183.3 GHz, 26 channels Spatial resolution: 10000 - 100000 m Swath width: 1500 km Accuracy: 0.4 - 2.0 K depending on spectral band
Multi-band UV/VIS Spectrometer (ACE) NASA	ACE	Proposed	Ocean colour instruments	Ocean colour spectrometer for measuring ocean leaving light which contains information on biological components.	Waveband: Spatial resolution: Swath width: Accuracy:
Multi-spectral thermal infrared imager (HyspIRI) NASA	HyspIRI	Proposed	Imaging multi-spectral radiometers (vis/IR)	Ecosystem focused mission with measurements of surface and cloud imaging with high spatial resolution, stereoscopic observation of local topography, cloud heights, volcanic plumes, and generation of local surface digital elevation maps, surface temperature and emissivity.	Waveband: 3-5 µm, 7.5-12 µm Spatial resolution: 60 m at nadir; 1 week revisit time Swath width: 600 km Accuracy: 0.1 K, <.01 µm
MUX Multispectral CCD Camera INPE (CAST)	CBERS-4	Operational	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm Spatial resolution: 20 m Swath width: 120 km Accuracy:
MUX (SJ-9A) Multispectral CCD Camera CRESDA	SJ-9A	Operational	High resolution optical imagers		Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm; 0.77 - 0.89 µm Spatial resolution: 10 m Swath width: 30 km Accuracy:
MUX (ZY-3) Multispectral CCD Camera CRESDA	ZY-3	Operational	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm Spatial resolution: 6 m Swath width: 52 km Accuracy:
MVIRI METEOSAT Visible and Infra-Red Imager EUMETSAT (ESA)	Meteosat-7	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, motion, height, upper tropospheric humidity and sea surface temperature.	Waveband: VIS - NIR: 0.5 - 0.9 µm, TIR: 5.7 - 7.1 µm (water vapour), 10.5 - 12.5 µm Spatial resolution: Visible: 2.5 km, Water vapour: 5 km (after processing), TIR: 5 km Swath width: Full Earth disk in all three channels, every 30 minutes Accuracy: Cloud top height: 0.5 km, Cloud top/ sea surface temperature: 0.7 K, Cloud cover 15%
MVIRS Moderate Resolution Visible and Infrared Imaging Spectroradiometer NRSCC (CAST)	FY-3F, FY-3G	Approved	Imaging multi-spectral radiometers (vis/IR)	Measures surface temperature and cloud and ice cover. Used for snow and flood monitoring and surface temperature.	Waveband: VIS - TIR: 0.47 - 12.5 µm (20 channels) Spatial resolution: Swath width: Accuracy:
MWAS MicroWave Atmospheric Sounder NRSCC (CAST)	FY-3A, FY-3B	Operational	Atmospheric temperature and humidity sounders	Meteorological applications.	Waveband: Microwave: 19.35 - 89.0 GHz (8 channels) Spatial resolution: Swath width: Accuracy:
MWHS MicroWave Humidity Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B	Operational	Atmospheric temperature and humidity sounders	Meteorological applications.	Waveband: Microwave: 19.35 - 89.0 GHz (8 channels) Spatial resolution: 15 km at media, 41 x 27 km at outer edge Swath width: 2700 km Accuracy: 15 km
MWHS-2 Improved MicroWave Humidity Sounder CAST (NSMC-CMA)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Operational	Atmospheric temperature and humidity sounders	Meteorological applications.	Waveband: Spatial resolution: Swath width: Accuracy:
MWI Microwave Imager EUMETSAT (ESA)	EPS-SG-b	Proposed	Imaging multi-spectral radiometers (passive microwave)	Measure cloud liquid water, ice cloud content, precipitation, total column water vapour, snow parameters, sea ice parameters	Waveband: Microwave: 18 channels between 18.7 GHz to 183 GHz Spatial resolution: Swath width: Accuracy:

MWI Microwave Instrument NASA	GRACE FO	Being developed	Gravity instruments		Waveband: Spatial resolution: Swath width: Accuracy:
MWR MicroWave Radiometer CONAE	SAC-D/Aquarius	Operational	Multiple direction/polarisation radiometers	Precipitation rate, wind speed, sea ice concentration, water vapour, clouds liquid water.	Waveband: (Ka & K Band) 23.8 GHz V Pol and 36.5 GHz H and V Pol Eight beams per frequency Spatial resolution: <54 km Swath width: 380 km Accuracy: .1 K
MWRI MicroWave Radiation Imager NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C, FY-3D, FY-3F	Operational	Imaging multi-spectral radiometers (passive microwave)	All weather observations of precipitation, cloud features, vegetation, soil moisture sea ice, etc.	Waveband: 12 channels, 6 frequencies: 10.65 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, 89 GHz, 150 GHz Spatial resolution: 7.5 x 12 km at 150 GHz to 51 x 85 km at 10.65 GHz Swath width: 1400 km Accuracy:
MWS Microwave Sounder EUMETSAT (ESA)	EPS-SG-a, EPS-SG-b	Proposed	Atmospheric temperature and humidity sounders	All-weather night-day temperature sounding	Waveband: 25 channels from 23.8 to 229 GHz Spatial resolution: Footprint size 17 - 80 km (Threshhold) Swath width: Accuracy:
MWTS Microwave Temperature Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B	Operational	Atmospheric temperature and humidity sounders	Temperature sounding in nearly all weather conditions.	Waveband: 50.3 GHz, 53.6 GHz, 54.94 GHz, 57.29 GHz Spatial resolution: 62 km Swath width: 750 - 1125 km Accuracy: 50 - 75 km
MWTS-2 Improved Microwave Temperature Sounder CAST (NSMC-CMA)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Operational	Atmospheric temperature and humidity sounders	Temperature sounding in nearly all weather conditions.	Waveband: Spatial resolution: Swath width: Accuracy:
MX (Cartosat-3) Multispectral VNIR ISRO	CARTOSAT-3	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: VNIR Multispectral Spatial resolution: 1 m Swath width: 16 km Accuracy:
Next Gen APS (ACE) NASA	ACE, PACE	Proposed	Multiple direction/polarisation radiometers	Polarimeter for measuring aerosol optical properties and aerosol types.	Waveband: Spatial resolution: Swath width: Accuracy:
NigeriaSat Medium and High Resolution NigeriaSat Remote Sensing (Medium and High Resolution) NASRDA	NigeriaSat-2	Operational	High resolution optical imagers	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: NIR: ~0.75 - ~1.3 µm, VIS: ~0.40 - ~0.75 µm Spatial resolution: 2.5 PAN, 5 m multispectral (red blue green,NIR), 32 m multispectral (red, green, NIR) Swath width: 20 x 20 km , 300 x 300 km Accuracy: 35 - 45 m
NigeriaSat Medium Resolution NigeriaSat Remote Sensing (Medium Resolution) NASRDA	NigeriaSat-X	Operational	Imaging multi-spectral radiometers (vis/IR)	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: NIR: ~0.75 - ~1.3 µm, VIS: ~0.40 - ~0.75 µm Spatial resolution: 22 m multispectral (red, green and NIR) Swath width: 600 x 600 km Accuracy: 150 - 300 m
NIR-SWIR Multi-spectral Optical Camera near&short_wave_infrared CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Approved	Ocean colour instruments	Ocean Colour - Open ocean, coastal & in-land waters. Atmospheric corrections	Waveband: Near & Short Wave Infrared 6 bands- 750 - 765 - 865 -1044 - 1240 - 1640 - 2130 nm Spatial resolution: 400m - 800 m Swath width: 1350 km Accuracy:
NIRST New Infrared Sensor Technology CONAE (CSA)	SAC-D/Aquarius	Operational	Imaging multi-spectral radiometers (vis/IR)	NIRST (two linear microbolometric arrays, respectively sensitive to the TIR bands). It measures the characteristics of high temperature events on land (fires & volcanoes) and sea surface temperatures on selected targets.	Waveband: • Band 1: 3.4-4.2 um • Band 2: 10.4-11.3 um • Band 3: 11.4-12.3 um Spatial resolution: Space resol: 450 m (at nadir) Swath width: Instant: 182 km; Extended: 1000 km Accuracy:
NISTAR NIST active Cavity Radiometer NASA (NOAA)	DSCOVR	Being developed	Earth radiation budget radiometers	Measure the energy emitted and reflected by the Earth.	Waveband: 0.2 - 100 µm in 4 channels Spatial resolution: Swath width: Accuracy: 0.1% accuracy; 0.03% precision
NMS Neutral Mass Spectrometer CSA	ePOP on CASSIOPE	Operational	Space environment	The Neutral Mass and velocity Spectrometer (NMS) measures mass composition and velocity of neutral atmospheric species in the 1-40 amu mass and 0.1-2 km/s velocity range.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
NOAA Comms Communications package for NOAA NOAA	NOAA-15, NOAA-18, NOAA-19	Operational	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
Norsat-1 Instrument NSC	Norsat-1	Proposed			Waveband: Spatial resolution: Swath width: Accuracy:
Ocean Color Spectrometer NASA	ACE, PACE	Proposed	Ocean colour instruments	Ocean colour spectrometer for measuring ocean leaving light which contains information on biological components.	Waveband: Near UV-VIS (360 - 710 nm); NIR (748 - 865 nm); SWIR (1245, 1640, 2135 nm) Spatial resolution: 1 km Swath width: 2500 km swath Accuracy:
OCM Ocean Colour Monitor ISRO	OCEANSAT-2	Operational	Ocean colour instruments	Ocean colour data, Estimation of phytoplankton concentration, identification of potential fishing zones, assessment of primary productivity.	Waveband: VIS - NIR: 0.40 - 0.88 µm (8 channels) Spatial resolution: 236 x 360m Swath width: 1400 km Accuracy:
OCM (Oceansat-3) Ocean Colour Monitor (Oceansat-3) ISRO	OCEANSAT-3	Proposed	Ocean colour instruments	Ocean colour data, Estimation of phytoplankton concentration, identification of potential fishing zones, assessment of primary productivity.	Waveband: 13 channel Spatial resolution: 360m Swath width: 1400 km Accuracy:
OCS Ocean colour scanner ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Being developed	Ocean colour instruments	Ocean colour data, estimation of phytoplankton concentration.	Waveband: 0.41 - 0.9 µm, 8 channels Spatial resolution: 1 km Swath width: 3000 km Accuracy: TBD
OLCI Ocean and Land Colour Imager ESA (EC)	Sentinel-3 A, Sentinel-3 B, Sentinel-3 C	Approved	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Marine and land services.	Waveband: 21 bands in VNIR/SWIR Spatial resolution: 300 m Swath width: 1270 km, across-track tilt 12.2 deg to the West Accuracy: 2% abs, 0.1% rel.
OLI Operational Land Imager USGS (NASA)	Landsat 8	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures surface radiance and emittance, land cover state and change (eg vegetation type). Used as multi-purpose imagery for land applications.	Waveband: VIS - SWIR: 9 bands: 0.43 - 2.3 µm Spatial resolution: Pan: 15 m, VIS - SWIR: 30 m Swath width: 185 km Accuracy: Absolute geodetic accuracy of 65 m; relative geodetic accuracy of 25 m (excluding terrain effects); geometric accuracy of 12 m or better
OLS Operational Linescan System NOAA (DoD (USA))	DMSP F-14, DMSP F-15, DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Imaging multi-spectral radiometers (vis/IR)	Day and night cloud cover imagery.	Waveband: VIS - NIR: 0.4 - 1.1 µm, TIR: 10.0 - 13.4 µm, and 0.47 - 0.95 µm Spatial resolution: 0.56 km (fine), 5.4 km (stereo products) Swath width: 3000 km Accuracy:
OMI Ozone Measuring Instrument NSO (NASA)	Aura	Operational	Atmospheric chemistry	Mapping of ozone columns, key air quality components (NO2, SO2, BrO, OClO and aerosols), measurements of cloud pressure and coverage, global distribution and trends in UV-B radiation.	Waveband: UV: 270 - 314 nm and 306 - 380 nm, VIS: 350 - 500 nm Spatial resolution: 13 x 24 km or 36 x 48 km depending on the product. Also has zoom modes (13 x 13 km) for example for urban pollution detection Swath width: 2600 km Accuracy:

OMPS Ozone Mapping and Profiler Suite NOAA	JPSS-1, JPSS-2, Suomi NPP	Operational	Atmospheric chemistry	Measures total amount of ozone in the atmosphere and the ozone concentration variation with altitude.	Waveband: Nadir Mapper: UV 0.3 - 0.38 µm, Nadir profiler: UV 0.25 - 0.31 µm, Limb soundings: UV - TIR 0.29 - 10 µm Spatial resolution: Mapper: 50 km, Profiler: 250 km, Limb: 1 km vertical Swath width: Mapper: 2800 km, Profiler: 250 km, Limb: 3 vertical slits along track +/- 250 km Accuracy: Total Ozone 15 Dobson units. Profile Ozone 10% between 15 and 60 km; 20% between Tropopause and 15 km
OMPS-L Ozone Mapping and Profiler Suite Limb Profiler NASA (NOAA)	JPSS-2	Being developed	Atmospheric chemistry	Measures total amount of ozone in the atmosphere and the ozone concentration variation with altitude.	Waveband: Limb soundings UV - TIR 0.29 - 10 um Spatial resolution: I km vertical Swath width: 3 vertical slits along track +/- 250 km Accuracy: Total Ozone 15 Dobson units. Profile Ozone 10% between 15 and 60 km; 20% between Tropopause and 15 km
OMS Ozone Monitoring Suite CAST (NSMC-CMA)	FY-3E, FY-3G	TBD	Atmospheric chemistry	Ozone total column vertical profile measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
OSIRIS Optical Spectrograph and Infra-Red Imaging System CSA (SNSB)	Odin	Operational	Atmospheric chemistry	Detects aerosol layers and abundance of species such as O3, NO2, OClO, BrO and NO. Consists of spectrograph and IR imager.	Waveband: Spectrograph: UV - NIR: 0.28 - 0.80 µm; IR Imager: NIR: 1.26 µm, 1.27 µm, 1.52 µm Spatial resolution: Spectrograph 1 km at limb, Imager 1 km in vertical Swath width: N/A, but measures in the altitude range 5 - 100 km Accuracy: Depends on species. Ozone meets requirements for trend analysis
Overhauser Magnetometer OM CNES	Ørsted (Oersted)	Operational	Magnetic field	Measurements of the strength of the Earth's magnetic field.	Waveband: Spatial resolution: Swath width: Accuracy:
P-Band SAR P-Band Synthetic Aperture Radar ESA	BIOMASS	Being developed	Imaging microwave radars	Forest biomass monitoring	Waveband: P-band: 435 MHz; four polarization channels - HH, HV, VH, and VV - together with height measurements from polarimetric interferometry; incidence angles ranging from 23 to 31 degrees Spatial resolution: Strip mode: 9 m, Interferometric wide swath mode: 20 m, extra-wide swath mode: 50 m, wave mode: 50 m Swath width: Strip mode: 80 km; Interferometric wide swath mode: 250 km, extra-wide swath mode: 400 km, Wave mode: sampled images of 20 x 20 km at 100 km intervals Accuracy: NESZ: -22 dB; PTAR: -25 dB; DTAR: -22 dB; Radiometric accuracy 1 dB (3 sigma); Radiometric stability: 0.5 dB (3 sigma)
PALSAR-2 (ALOS-2) Phased Array type L-band Synthetic Aperture Radar-2 JAXA	ALOS-2	Operational	Imaging microwave radars	Disaster Monitoring, Land monitoring, Agricultural Monitoring, Natural Resource Exploration, Global Forest Monitoring, Potential use and interferometry.	Waveband: Microwave: L-Band 1270 MHz Spatial resolution: Spotlight mode (1 to 3 m), stripmap mode (3 to 10 m). Swath width: Spotlight mode: 25km, Stripmap mode: 50-70 km, Scan SAR mode: 350 - 490 km, Polarimetry: 30-50 km Accuracy: Surface Resolution: 1 to 3 m (Spotlight Mode), 3m (Ultra-Fine Mode), 6m (High sensitive Mode), 10m (Fine Mode),100 m (Scan Mode); Radiometric: ±1 dB
Pamela ROSKOSMOS	Resurs DK 1	Operational	Space environment	Cosmic ray research.	Waveband: Spatial resolution: Swath width: Accuracy:
PAN (Cartosat-1) Panchromatic Camera ISRO	CARTOSAT-1	Operational	High resolution optical imagers	High resolution stereo images for study of topography, urban areas, development of DTM, run-off models etc. Urban sprawl, forest cover/timber volume, land use change.	Waveband: Panchromatic VIS: 0.5 - 0.75 µm Spatial resolution: 2.5 m Swath width: 30 km Accuracy:
PAN (Cartosat-2) Panchromatic Camera ISRO	CARTOSAT-2	Operational	High resolution optical imagers	High resolution stereo images for large scale (better than 1:0000) mapping applications, urban applications, GIS ingest.	Waveband: VIS: 0.5 - 0.75 µm Spatial resolution: 1 m Swath width: 10 km Accuracy:
PAN (Cartosat-2A/2B) Panchromatic Camera ISRO	CARTOSAT-2A, CARTOSAT-2B	Operational	High resolution optical imagers	High resolution stereo images for large scale (better than 1:0000) mapping applications, urban applications, GIS ingest.	Waveband: VIS: 0.5 - 0.75 µm Spatial resolution: 1 m Swath width: 10 km Accuracy:
PAN (Cartosat-2E) Panchromatic Camera ISRO	CARTOSAT-2E	Operational	High resolution optical imagers	High resolution stereo images for large scale (better than 1:0000) mapping applications, urban applications, GIS ingest.	Waveband: VIS: 0.5 - 0.75 µm Spatial resolution: 0.65 m Swath width: 9 km Accuracy:
PAN (Cartosat-3) Panchromatic sensor ISRO	CARTOSAT-3	Being developed	High resolution optical imagers	High resolution images for study of topography, urban areas, development of DTM, run-off models etc. Urban sprawl, forest cover/timber volume, land use change.	Waveband: Panchromatic VIS: 0.5 - 0.75 µm Spatial resolution: 0.3 m Swath width: 15 km Accuracy:
PAN (CBERS) Panchromatic and multispectral imager CAST (INPE)	CBERS-4	Operational	High resolution optical imagers	Earth resources, environmental monitoring, land use, urban studies.	Waveband: 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm, 0.51 - 0.85 µm Spatial resolution: 5 m panchromatic and 10 m multispectral Swath width: 60 km Accuracy:
PAN (GISTDA) Panchromatic imager GISTDA	THEOS	Operational	High resolution optical imagers	THEOS PAN is an optical instrument with resolution 2 m and swath width at 22 km. It can be used in several applications such as cartography, land use planning and management, national security, etc.	Waveband: 0.45 - 0.90 µm Spatial resolution: 2 m Swath width: 22 km Accuracy: GSD for PAN = 2 m +/- 10% MTF for PAN > 0.10
PAN (SJ-9A) Panchromatic and multispectral imager CRESDA	SJ-9A	Operational	High resolution optical imagers		Waveband: 0.45 - 0.89 µm Spatial resolution: 2.5 m Swath width: 30 km Accuracy:
PAN (ZY-02C) Panchromatic and multispectral imager CRESDA	ZY-02C	Operational	High resolution optical imagers	Earth resources, environmental monitoring, land use	Waveband: 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm, 0.51 - 0.85 µm Spatial resolution: 5 m panchromatic and 10 m multispectral Swath width: 60km Accuracy:
PAN CAMERA Panchromatic Camera ASI	PRISMA	Approved	High resolution optical imagers	Panchromatic data.	Waveband: VIS: 400 - 700 nm Spatial resolution: 5 m Swath width: 30 km Accuracy: -
PAN+MS (RGB+NIR) Ingenio PAN+MS (RGB+NIR) CDTI (ESA)	Ingenio	Being developed	High resolution optical imagers	High resolution multi–spectral land optical images for applications in cartography, land use, urban management, water management, agriculture and environmental monitoring, risk management and security.	Waveband: VIS+NIR band: 520 - 670 nm, 410 - 480 nm, 520 - 580 nm, 610 - 670 nm, 790 - 880 nm Spatial resolution: PAN: 2.5 m, MS: 10 m Swath width: Swath will move between 55 and 60 km depending on latitude. Accuracy: SNR: 100 in PAN and 120 in MS. The geo-location accuracy of level 1c PAN data product shall be better than or equal to 2.5 m RMS 2D in nadir view.
Paz SAR-X X Band Synthetic Aperture Radar CDTI	PAZ	Being developed	Imaging microwave radars	High resolution X-band radar for security, land use, urban management, environmental monitoring, risk management. Different acquisition modes: Spotlight (5 x 5-10 km SSD =<1 m), Scansar (100 x 100 km, SSD <=15 m); Stripmode (strips of 30 x 30 km with SSD 3 m).	Waveband: The Radar will use a frequency close to 9.65 GHz with an BW of 300 MHz. Spatial resolution: Resolution will move between <1 x 1 m and 6 x 18m depending on acquisition modes. Swath width: Swath will vary according to the acquisition mode: 5x5 km to 100 km x 100 km. Accuracy: Pixel Localization: Pixel Localization: 50 cm to 8.5 m (1s) depending of the product selected.

PCW PHEOS - Atmospheric Polar Highly Elliptical Orbit Science Weather, Climate & Air Quality Mission CSA (EnvCan)	PCW-1, PCW-2	Proposed	Atmospheric chemistry	Complement PCW operational numerical weather prediction. Will also collect information about atmospheric gaseous and aerosol composition to better understand transport and climate processes. .	Waveband: 4 non-continuous bands from 0.758 - 14.3 um at a spectral sampling of 0.25 cm-1. Spatial resolution: 10 x 10 km Swath width: Field of View is 560 x 560km. Field of Regard is 3024 x 3530 km. Accuracy: Cal/Val requirements currently being developed
PCW PHEOS - Solar-Terrestrial Polar Highly Elliptical Orbit Science, Solar-Terrestrial Mission CSA	PCW-1, PCW-2	Proposed	Space environment	Combination of payloads to study the near-Earth space dominated by plasmas and to observe the electromagnetic and charged particle environments in a highly elliptical orbit. May potentially include both in-situ space weather instruments and an Auroral imager.	Waveband: Dual band LBH long (160 - 175 nm) and LBH short (140 - 160 nm) for the Auroral imager. N.A. for the in-situ space weather instruments. Spatial resolution: 40 km for the Auroral imager. Not applicable for the in-situ space weather instruments. Swath width: Field of Regard for each full acquisition is the entire Earth disc. N.A. for the in-situ space weather instruments. Accuracy: Cal/Val requirements currently being developed
PCWMP PCW Meteorological Payload (1 on each PCW S/C) CSA (EnvCan)	PCW-1, PCW-2	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous high-temporal resolution measurements of atmospheric properties over the Arctic. Associated observations, using additional instruments include in situ space weather and also broadband radiometry of Earth.	Waveband: Multiple bands, non-continuous, from 0.45 µm - 14.5 µm Spatial resolution: Band dependent, varies from 0.5 km GSD (goal) for some of the VNIR bands to 2 km GSD for TIR bands. Swath width: Field of Regard for each full acquisition is the entire Earth disc Accuracy: Cal/Val requirements currently being developed
PHA Pulse Height Analyzer NOAA (NASA)	DSCOVR	Being developed	Space environment		Waveband: Spatial resolution: Swath width: Accuracy:
Plasma-Mag NOAA (NASA)	DSCOVR	Being developed	Space environment	Magnetometer and plasma sensor to measure solar wind properties for forecasting geomagnetic storms. The Plasma-mag instrument comprises a Faraday Cup (measures solar wind) and a Fluxgate Magnetometer, as well as two space weather instruments: the Electron Spectrometer and the Pulse Height Analyzer.	Waveband: Spatial resolution: Swath width: Accuracy:
Polarimeter NASA	ACE, PACE	Proposed			Waveband: Spatial resolution: Swath width: Accuracy:
POSEIDON-3 Positioning Ocean Solid Earth Ice Dynamics Orbiting Navigator (Single frequency solid state radar altimeter) CNES	OSTM (Jason-2)	Operational	Radar altimeters	Nadir viewing sounding radar for provision of real-time high precision sea surface topography, ocean circulation and wave height data.	Waveband: Microwave: Ku-band (13.575 GHz), C-band (5.3 GHz) Spatial resolution: Basic measurement: 1/sec (6 km along track), Raw measurement: 10/sec (600 m along track) Swath width: On baseline TOPEX/POSEIDON orbit (10 day cycle): 300 km between tracks at equator Accuracy: Sea level: 3.9 cm, Significant wave height: 0.5 m, Horizontal sea surface wind speed: 2 m/s
POSEIDON-3B Altimeter Positioning Ocean Solid Earth Ice Dynamics Orbiting Navigator (Single frequency solid state radar altimeter) CNES	Jason-3	Operational	Radar altimeters	Nadir viewing sounding radar for provision of real-time high precision sea surface topography, ocean circulation and wave height data.	Waveband: Microwave: Ku-band (13.575 GHz), C-band (5.3 GHz) Spatial resolution: Basic measurement: 1/sec (6 km along track), Raw measurement: 20/sec (300 m along track) Swath width: On baseline TOPEX/POSEIDON orbit (10 day cycle): 300 km between tracks at equator Accuracy: Sea level: 3.4 cm, Significant wave height: 0.4 m, Horizontal sea surface wind speed: 1.5 m/s
Poseidon-4 Altimeter Poseidon-4 SAR Radar Altimeter CNES (ESA)	Sentinel-6 A, Sentinel-6 B	Being developed	Radar altimeters		Waveband: Microwave: Ku-band (13.575 GHz), C-band (5.3 GHz) Spatial resolution: Swath width: Accuracy:
PR Precipitation Radar JAXA (NICT, NASA)	TRMM	Operational	Cloud profile and rain radars	Measures precipitation rate in tropical latitudes.	Waveband: Microwave: 13.796 GHz and 13.802 GHz Spatial resolution: Range resolution: 250 m Horizontal resolution: 4.3 km at nadir (post-boost: 5 km) Swath width: 215 km (post-boost: 245 km) Observable range: from surface to approx 15 km altitude Accuracy: Rainfall rate 0.7 mm/h at storm top
PSS Panchromatic imaging system ROSKOSMOS (ROSHYDROMET)	Kanopus-V, Kanopus-V-IR	Operational	High resolution optical imagers	Panchromatic data for environmental monitoring, agriculture and forestry.	Waveband: 0.54 - 0.86 µm Spatial resolution: 2.5 m Swath width: 23 km Accuracy:
Radiomet Radio-occultation receiver ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Approved	Atmospheric temperature and humidity sounders	Atmospheric temperature and humidity profiles with high vertical resolution.	Waveband: Spatial resolution: Swath width: Accuracy:
RASAT VIS Multispectral RASAT VIS Multispectral camera TUBITAK	RASAT	Operational	Imaging multi-spectral radiometers (vis/IR)	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: Band 1: 0.42 - 0.55 µm, Band 2: 0.55 - 0.63 µm, Band 3: 0.58 - 0.73 µm Spatial resolution: 15 m Swath width: 30 km Accuracy:
RASAT VIS Panchromatic RASAR VIS Panchromatic camera TUBITAK	RASAT	Operational	Imaging multi-spectral radiometers (vis/IR)	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: 0.42 - 0.73 µm Spatial resolution: 7.5 m Swath width: 30 km Accuracy:
RBI Radiation Budget Instrument NASA	JPSS-2	Being developed	Earth radiation budget radiometers	Long term measurement of the Earth's radiation budget and atmospheric radiation from the top of the atmosphere to the surface; provision of an accurate and self-consistent cloud and radiation database.	Waveband: 3 channels: 0.3-5 µm, 0.3 - 100 µm, 8 - 12 µm Spatial resolution: 20 km Swath width: Accuracy: 0.5%, 1%, 0.3% (respectively for the 3 channels)
RO EUMETSAT (ESA)	EPS-SG-a, EPS-SG-b	Proposed	Other	GNSS receiver for atmospheric temperature and humidity profile sounding.	Waveband: L-Band 1575.42, 1176.45, 1176.45 MHz Spatial resolution: <1.5 km Swath width: Altitude range of 0 - 30 km Accuracy: Temperature sounding better 1 K rms
ROSA Radio Occultation Sensor for Atmosphere ISRO	MEGHA-TROPIQUES	Operational	Atmospheric temperature and humidity sounders	Enables measurement of water vapour and temperature profiles in the tropics.	Waveband: Spatial resolution: Swath width: Accuracy:
ROSA Radio Occultation Sounder for the Atmosphere ASI (CONAE)	SAC-D/Aquarius	Operational	Atmospheric temperature and humidity sounders and precision orbit	Climate change studies. High-vertical resolution temperature-humidity sounding for NWP. Space weather.	Waveband: Around 1600 MHz (L1) and 1200 MHz (L2). Spatial resolution: 300 km (horizontal), 0.5 km (vertical). Swath width: N/A (occultation); about 600 soundings/day. Accuracy: Bending angle: 0.5 µ rad
ROSA Radio Occultation Sounder for the Atmosphere ASI (ISRO)	OCEANSAT-2	Operational	Atmospheric temperature and humidity sounders and precision orbit	Climate change studies. High-vertical resolution temperature-humidity sounding for NWP. Space weather.	Waveband: Around 1600 MHz (L1) and 1200 MHz (L2). Spatial resolution: 300 km (horizontal), 0.5 km (vertical). Swath width: N/A (occultation); about 300 soundings/day. Accuracy: Bending angle: 0.5 µ rad
RRA Retroreflector Array CNES	Diademe 1&2	Operational	Precision orbit	Satellite laser ranging for geodynamic measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
RRI Radio Receiver Instrument CSA	ePOP on CASSIOPE	Operational	Space environment	The RRI measures wave electric fields in the 10Hz - 18MHz range, at magnitudes from 1 µV/m to 1 V/m to study the morphology and dynamics of ionospheric density structures, auroral wave-particle interactions, plasma nonlinear processes created by intense high frequency waves, and the mechanism of coherent wave backscatter.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
S-Band SAR S-Band Synthetic Aperture Radar CAST	HJ-1C	Operational	Imaging microwave radars	Radar measurements for natural and disaster monitoring.	Waveband: S-Band SAR Spatial resolution: 20 m (4 looks) Swath width: 100 km Accuracy: 3 dB

S-band SAR (NISAR) S-band Synthetic Aperture Radar (SAR) (NISAR) ISRO	NISAR	Proposed	Imaging microwave radars	3-year mission to study solid earth deformation (earthquakes, volcanoes, landslides), changes in ice (glaciers, sea ice) and changes in vegetation biomass	Waveband: S-Band: 4-2 GHz Spatial resolution: At 12-day repeat, global coverage, 10m resolution Swath width: 240 km Accuracy: TBD
S&R (GOES) Search and Rescue NOAA	GOES-13, GOES-14, GOES-15	Operational	Other	Satellite and ground based system to detect and locate aviators, mariners, and land-based users in distress.	Waveband: Spatial resolution: Swath width: Accuracy:
S&R (NOAA) Search and Rescue Satellite Aided Tracking NOAA	Metop-A, Metop-B, NOAA-15, NOAA-18, NOAA-19, SIDAR	Operational	Other	Satellite and ground based system to detect and locate aviators, mariners, and land-based users in distress.	Waveband: Spatial resolution: Swath width: Accuracy:
SAGE-III Stratospheric Aerosol and Gas Experiment NASA	SAGE-III	Being developed	Atmospheric chemistry	Limb-viewing measurements of aerosol, O3, H20, NO2, OClO, NO3, temperature and pressure in the stratosphere, upper troposphere, and mesosphere using solar occultation, lunar occultation and limb scatter measurement techniques.	Waveband: Nine spectral regions between 290 - 1550 nm Spatial resolution: 1 - 2 km vertical Swath width: N/A Accuracy: Aerosol profile: 5%, H20: 10 - 15%; NO2: 10-15%; NO3: 10%; O3: 5%; OClO: 25%; Pressure: 2%; Temperature Profile; 2K
SAPHIR Sondeur Atmospherique du Profil'd'Humidite Intertropicale par Radiometrie CNES	MEGHA-TROPIQUES	Operational	Atmospheric temperature and humidity sounders	Cross-track sounder with the objective of measuring water vapour profiles in the troposphere in six layers from 2 - 12 km altitudes.	Waveband: Microwave: 183.3 GHz (6 channels) Spatial resolution: 10 km Swath width: 2200 km Accuracy:
SAR Synthetic Aperture Radar X band ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Being developed	Imaging microwave radars	High resolution microwave radar images for ice watch.	Waveband: X-Band Spatial resolution: 1 m, 5 m, 50 m, 200 m, 500 m Swath width: 10 km, 50 km, 130 km, 600 km, 750 km Accuracy: 1 dB
SAR (RADARSAT-2) Synthetic Aperture Radar (CSA) C band CSA	RADARSAT-2	Operational	Imaging microwave radars	All-weather images of ocean, ice and land surfaces. Used for monitoring of coastal zones, polar ice, sea ice, sea state, geological features, vegetation and land surface processes.	Waveband: Microwave: C band 5.405 GHz. HH, VV, HV, VH polarization - includes Quad polarization imaging modes. Spatial resolution: Standard: 27 - 17 x 25 m (4 looks); Wide: 40 - 19 x 25 m (4 looks); Fine: 10 - 7 x 8 m (1 look); ScanSAR (N/W): 80 - 38 x 60 m / 160 - 172 x 100 m (4/8 looks), Extended (H/L): 18 - 16 x 25 m / 60 - 23 x 25 m (4 looks); Ultra-Fine: 4.6 - 2.1 x 2.8 m (1 lo Swath width: Standard: 100 km (inc.: 20 - 49 deg); Wide: 150 km (inc.: 20 - 45 deg); Fine: 50 km (inc.: 30 - 50 deg); ScanSAR (N/W): 300/500 km (inc.: 20 - 46 / 20 - 49 deg); Extended (H/L): 75/170 km (inc.: 49 - 60 / 10 - 23 deg); Ultra-Fine: 20 km (inc.: 20 - 49 deg Accuracy: Relative Radiometric Accuracy (within a 100 km scene): <1 dB
SAR (RCM) Synthetic Aperture Radar (CSA) C band CSA (NRCAN, DND, DFO, AAFC, EnvCan, PSC)	RADARSAT C-1, RADARSAT C-2, RADARSAT C-3	Being developed	Imaging microwave radars	All-weather, C-band data to support ecosystem monitoring, maritime surveillance and disaster management.	Waveband: Microwave: C band 5.405 GHz: HH, VV, HV, VH polarization - includes Quad polarization imaging mode and compact polarimetry. Spatial resolution: Low Resolution 100 m: 100 x 100 m (8 looks); Medium Resolution 50 m: 50 x 50 m (4 looks); Medium Resolution 16 m: 16 x 16 m (4 looks); Medium Resolution 30 m: 30 x 30 m (4 looks); High-Resolution 5 m: 5 x 5 m (1 look); Very High Resolution 3 m: 3 (@35deg) Swath width: Low Resolution 100 m: 500 km; Medium Resolution 50 m: 350 km; Medium Resolution 16 m: 30 km; Medium Resolution 30 m: 125 km; High-Resolution 5 m: 30 km; Very High Resolution 3 m: 20 km; Low Noise 100m: 350 km; Spotlight: 5 km; Ship Detection: 350 km. Accuracy: Absolute Radiometric Accuracy: +/- 1.0 dB Scansar discontinuities: 0.2 dB
SAR (RISAT) Synthetic Aperature Radiometer (RISAT) ISRO	RISAT-1, RISAT-1A	Operational	Imaging microwave radars	Radar backscatter measurements of land, water and ocean surfaces for applications in soil moisture, crop applications (under cloud cover), terrain mapping, etc.	Waveband: C-Band (5.350 Ghz) Spatial resolution: 3 - 6 m (FRS-1), 9 - 12 m (FRS-2), 25/50 m (MRS/CRS) Swath width: 30 km (HRS), 30 km (FRS-1/FRS-2), 120/240 km (MRS/CRS) Accuracy:
SAR 2000 Synthetic Aperture Radar - 2000 ASI (MoD (Italy))	COSMO-SkyMed 1, COSMO-SkyMed 2, COSMO-SkyMed 3, COSMO-SkyMed 4	Operational	Imaging microwave radars	All-weather images of ocean, land and ice for monitoring of land surface processes, ice, environmental monitoring, risk management, environmental resources, maritime management, Earth topographic mapping.	Waveband: Microwave: X-band, 9.6 GHz, with choice of 5 polarisation modes (VV, HH, HV, VH, HH/HV + VV/VH) Spatial resolution: Single polarisation modes; Spotlight: 1 m. Stripmap: 3 - 15 m, ScanSAR: 30 or 100 m. Two polarisation mode (PING-PONG): 15 m. Swath width: Single polarisation modes: Spotlight: 10 km. Stripmap; 40 km. ScanSAR: 100 or 200 m - Two polarisation mode (PING-PONG): 30 km. Accuracy:
SAR components testing CONAE	SARE-1B	TBD	TBD		Waveband: Spatial resolution: Swath width: Accuracy:
SAR Payload KARI	KOMPSAT-6	Approved	Imaging microwave radars		Waveband: Spatial resolution: Swath width: Accuracy:
SAR-L L-Band Synthetic Aperture Radar CONAE	SAOCOM 1A, SAOCOM 1B, SAOCOM-2A, SAOCOM-2B	Being developed	Imaging microwave radars	Land, ocean, emergencies, soil moisture, interferometry, others.	Waveband: L-band (1.275 GHz) Spatial resolution: 10 x 10 m – 100 x 100 m Swath width: 20 – 350 km Accuracy: 0.5 dB
SAR-X Synthetic Aperature Radiometer (RISAT-2) ISRO	RISAT-2	Operational	Imaging microwave radars	For disaster management applications.	Waveband: X Band (9.0 Ghz) Spatial resolution: 3 - 8 m Swath width: 10 km, 50 km Accuracy:
SBUV/2 Solar Backscattter Ultra-Violet Instrument/2 NOAA	NOAA-18, NOAA-19	Operational	Atmospheric chemistry	Data on trace gases including vertical profile ozone, and solar irradiance and total ozone concentration measurements.	Waveband: UV: 0.16 - 0.4 µm (12 channels) Spatial resolution: 170 km Swath width: Accuracy: Absolute accuracy: 1%
SCA EUMETSAT (ESA)	EPS-SG-b	Approved	Scatterometers	Measures wind speed and direction over ocean, soil moisture, sea ice cover, sea ice type, snow cover and snow parameters and vegetation parameters	Waveband: Microwave: C Band, exact frequency band TBC Spatial resolution: 25 km Swath width: 2x 550 km swath width Accuracy: Wind speeds in range 4 - 24 m/s
ScaRaB Scanner for Earth's Radiation Budget CNES	MEGHA-TROPIQUES	Operational	Earth radiation budget radiometers	Measures top-of-atmosphere shortwave radiation (0.2 - 4.0 µm) and total radiation (0.2 - 50 µm). Two additional narrow-band channels (0.5 - 0.7 µm and 11 - 12 µm) allow cloud detection and scene identification.	Waveband: VIS window channel: 0.5 - 0.7 µm, Solar channel UV - SWIR: 0.2 - 4 µm, Total channel UV - FIR: 0.2 - 50 µm, Thermal window channel: 10.5 - 12.5 µm Spatial resolution: 40 km Swath width: 2200 km Accuracy: Absolute: ± 2.5 W/m2/sr, Relative: ± 0.7 W/m2/sr
SCAT Wind SCATerometer CNES	CFOSAT	Being developed	Scatterometers	Ocean surface wind vector	Waveband: Ku-band Spatial resolution: Swath width: Accuracy:
Scatterometer (Meteor) Scatterometer ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Approved	Scatterometers	Ocean surface wind measurements.	Waveband: Ku-band Spatial resolution: 25 km Swath width: 1800 km Accuracy: Wind speed: 2 m/s, direction: 20 grad
Scatterometer (Scatsat-1) ISRO	SCATSAT-1	Operational	Scatterometers	Ocean surface wind measurements.	Waveband: 13.515 GHz Spatial resolution: 50 km Swath width: 1440 km Accuracy:

SDR Software Defined Radio NSC	AISSat-1, AISSat-2, AISSat-3	Operational	Communications	Software Defined Radio (SDR) for reception of VHF AIS (Automatic Identification System).	Waveband: VHF Spatial resolution: Swath width: Accuracy: Modelling shows that the instrument should detect more than 95% of the vessels carrying AIS within the satellite's field of view in the High North each orbit.
SeaWinds NASA	QuikSCAT	Operational	Scatterometers	Measurement of surface wind speed and direction. The SeaWinds antenna on QuikSCAT stopped rotating in November 2009, and the instrument no longer collects ocean wind vector data. However it still provides calibration data for other on-orbit scatterometers, which enables the continuation of a climate-quality wind vector dataset.	Waveband: Microwave: 13.402 GHz Spatial resolution: 25 km Swath width: 1600 km Accuracy: Speed: 2 - 3.5 m/s Direction: 20 deg
SEI Suprathermal Electron Imager CSA	ePOP on CASSIOPE	Operational	Space environment	The SEI measures the electron energy and pitch angle distribution over the energy range of 1 to 200 eV, with particular emphasis on photoelectrons in the 1 to 50 eV range.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
SEISS Space Environment In Situ Suite NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Space environment	Monitor proton, electron, and alpha particle fluxes.	Waveband: 30 eV - 500 MeV Spatial resolution: 15 deg, 30 deg, 60 deg, 90 deg Swath width: Accuracy: 25%
SEM Space Environment Monitor NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B	Operational	Space environment	Measures space environment parameters to support space craft operations.	Waveband: Spatial resolution: Swath width: Accuracy:
SEM (GOES) Space Environment Monitor NOAA	GOES-13, GOES-14, GOES-15	Operational	Space environment	Used for equipment failure analysis, solar flux measurement, solar storm warning, and magnetic and electric field measurement at satellite.	Waveband: Spatial resolution: Swath width: Accuracy:
SEM (POES) Space Environment Monitor NOAA	Metop-A, Metop-B, Metop-C, NOAA-18, NOAA-19	Operational	Space environment	Used for equipment failure analysis, solar flux measurement, solar storm warning, and magnetic and electric field measurement at satellite.	Waveband: Senses and quantifies intensity in the sequentially selected energy bands, with energies ranging from 0.05 - 20 keV. Senses protons, electrons, and ions with energies from 30 keV to levels exceeding 6.9 MeV Spatial resolution: Swath width: Accuracy:
SES Space Environment Suite, improved SEM CAST (NSMC-CMA)	FY-3C, FY-3D, FY-3E, FY-3F	Operational	Space environment	Measures space environment parameters to support space craft operations.	Waveband: Spatial resolution: Swath width: Accuracy:
SEVIRI Spinning Enhanced Visible and Infra-Red Imager EUMETSAT (ESA)	Meteosat-10, Meteosat-11, Meteosat-8, Meteosat-9	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurements of cloud cover, cloud top height, precipitation, cloud motion, vegetation, radiation fluxes, convection, air mass analysis, cirrus cloud discrimination, tropopause monitoring, stability monitoring, total ozone and sea surface temperature.	Waveband: VIS0.6=0.5975 - 0.6725 µm, VIS0.8=0.775 - 0.845 µm, NIR1.6=1.57 - 1.71 µm, IR3.9=3.7 - 4.14 µm, WV6.3=5.8 - 6.7 µm, WV7.3=7.1 - 7.6 µm, IR8.7=8.5 - 8.9 µm, IR9.7=9.52 - 9.8 µm, IR10.8=10.3 - 11.3 µm, IR12.0=11.5 - 12.5 µm, IR13.4=12.9 - 13.9 µm, HRV=~0.48 - 0.91 µm ,unfiltered Si (measured at FWHM) Spatial resolution: HRV=1 km, All other channels=3 km (spatial sampling distance at SSP) Swath width: 9 km swath scanning E-W, moving up S-N a swath width at the end of each swath. Full Disc Coverage (FDC) or Local Area Coverage (LAC) possible. Accuracy: Cloud cover: 10%, Cloud top height: 1 km, Cloud top temperature: 1 K, Cloud type: 8 classes, Surface temperature: 0.7 - 2.0 K, Specific humidity profile: 10%, Wind profile (horizontal component): 2 - 10 m/s, Long wave Earth surface radiation: 5 W/m2
SGLI Second-generation Global Imager JAXA		Approved	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Medium resolution multi-spectral imaging of land, ocean and atmosphere. SGLI-VNR is an optical sensor capable of multi-channel nadir observation at wavelengths from near-UV to NIR and forward or backward polarization observation at red and near infrared wavelengths (Push-broom scanning). SGLI-IRS is an optical sensor capable of multi-channel nadir observation at wavelengths from SWIR to TIR wavelengths (Cross-track scanning).	Waveband: VIS - NIR: 0.38 - 0.865 µm; SW: 1.05 - 2.21 µm; TIR: 10.8 - 12.0 µm Spatial resolution: SGLI-VNR: 250 m, 1000 m; SGLI-IRS: 250 m, 500 m, 1000 m Swath width: SGLI-VNR: 1150 km; SGLI-IRS: 1400km Accuracy:
SHMSA-SR Medium resolution wide capture multispectral optical sensor ROSKOSMOS	Resurs-P N1, Resurs-P N2, Resurs-P N3	Operational	Imaging multi-spectral radiometers (vis/IR)	Land surface and ocean monitoring	Waveband: 0.43 - 0.7 µm; 0.43 - 0.51 µm; 0.51 - 0.58 µm; 0.60 - 0.70 µm; 0.70 - 0.80 µm; 0.80 - 0.90 µm; Spatial resolution: 60 m; 120 m Swath width: 441 km Accuracy:
SHMSA-VR High resolution wide capture multispectral optical sensor ROSKOSMOS	Resurs-P N1, Resurs-P N2, Resurs-P N3	Operational	Imaging multi-spectral radiometers (vis/IR)	Land surface and ocean monitoring	Waveband: 0.43 - 0.7 µm; 0.43 - 0.51 µm; 0.51 - 0.58 µm; 0.60 - 0.70 µm; 0.70 - 0.80 µm; 0.80 - 0.90 µm; Spatial resolution: 12 m; 23,8 m Swath width: 97 km Accuracy:
SIM Solar Irradiation Monitor NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C, FY-3E	Operational	Earth radiation budget radiometers	Solar irradiance monitoring.	Waveband: 0.2 - 50 µm Spatial resolution: Swath width: Accuracy:
SIM Spectral Irradiance Monitor NASA	SORCE	Operational	Earth radiation budget radiometers	Measures solar spectral irradiance in the 200 - 2000 nm range.	Waveband: UV - SWIR: 200 - 2000 nm Spatial resolution: Swath width: Accuracy:
SIM-2 Solar Irradiation Monitor-2 NRSCC (NSMC-CMA, CAST)	FY-3C, FY-3E, FY-3G	Operational	Earth radiation budget radiometers	Solar irradiance monitoring.	Waveband: 0.2 - 50 µm Spatial resolution: Swath width: Accuracy:
SIRAL SAR Interferometer Radar Altimeter ESA	CryoSat-2	Operational	Radar altimeters	Marine ice and terrestrial ice sheet thickness measurement.	Waveband: Microwave: 13.575 GHz (Ku-Band) Spatial resolution: Range resolution 45 cm, along-track resolution 250 m Swath width: Footprint 15 km Accuracy: Arctic sea-ice: 1.6 cm/year for 300 km x 300 km cells, Land ice (small scale): 3.3 cm/year for 100 x 100 km cells, Land ice (large scale): 0.17 cm/year for Antarctica size area
SLIM-6-22 Surrey Linear Imager - 6 channel - 22m resolution UKSA	UK-DMC2	Operational	High resolution optical imagers	Visible and NIR imagery in support of disaster management - part of the Disaster Management constellation.	Waveband: VIS: 0.63 - 0.69 µm, 0.52 - 0.61 µm; NIR: 0.77 - 0.90 µm. Spatial resolution: 22 m Swath width: Two imaging banks each with a 330km swath. The two swaths overlap by 11km, providing a total swath up to 638km Accuracy: S/N 150:1 @ target albedo of 0.1.
SLSTR Sea and Land Surface Temperature Radiometer ESA (EC)	Sentinel-3 A, Sentinel-3 B, Sentinel-3 C	Approved	Imaging multi-spectral radiometers (vis/IR)	Marine and land services.	Waveband: 9 bands in VNIR/SWIR/TIR Spatial resolution: 500 m (VNIR/SWIR), 1 km (TIR) Swath width: 1675 km (near-nadir view), 750km (backward view) Accuracy: 0.2 K abs., 80 mK rel.
SMR Submillimetre Radiometer SNSB	Odin	Operational	Atmospheric temperature and humidity sounders and atmospheric chemistry	Measures global distributions of ozone and species of importance for ozone chemistry ClO, HNO3, H2O, N2O, (HO2, H2O2). Measures temperature in the height range 15 - 100 km.	Waveband: Microwave: 118.7 GHz + 4 bands in the region 480 - 580 GHz: Tuneable measures 2 - 3 x 1 GHz regions at a time; ~0.1 cm - ~0.3 cm Spatial resolution: Vertical resolution 1.5 - 3 km, along track 600 km Swath width: Altitudes of 5 - 100 km Accuracy: 2 - 40% depending on species and altitude

SOLSTICE SOLar STellar Irradiance Comparison Experiment NASA	SORCE	Operational	Earth radiation budget radiometers	Data on UV and charged particle energy inputs, and on time variation of full-disk solar UV spectrum. Measures solar UV radiation (115 - 430 nm) with resolution of 0.12 nm. Compares solar UV output with UV radiation of stable bright blue stars.	Waveband: UV: 115 - 180 nm and 170 - 320 nm Spatial resolution: Swath width: Accuracy: 1%
Sounder NOAA	GOES-13, GOES-14, GOES-15	Operational	Atmospheric temperature and humidity sounders	Atmospheric soundings and data on atmospheric stability and thermal gradient winds.	Waveband: VIS - TIR: 19 channels Spatial resolution: 10 km Swath width: Horizon to horizon Accuracy:
Sounder (INSAT) IR Sounder ISRO	INSAT-3D, INSAT-3DR	Operational	Atmospheric temperature and humidity sounders	Atmospheric soundings, atmospheric stability, thermal gradient winds.	Waveband: SWIR: 3.74 - 4.74 µm; MWIR: 6.51 - 11.03 µm; TIR: 12.02 - 14.71 µm; VIS: 0.55 - 0.75 µm Spatial resolution: 10 x 10 km Swath width: Full (Full Earth disc sounding), Program (Options provided for for Sector Scans) Accuracy:
Spectrometer (OCO-2) NASA	OCO-2	Operational	Atmospheric chemistry	Global measurements of atmospheric CO2 needed to describe the variability of CO2 sources and sinks.	Waveband: 0.76 µm, 1.61 µm, 2.06 µm Spatial resolution: 2.25 km downtrack, variable cross-track Swath width: Varies from 0.1 km at the sub-solar latitude to 10.6 km at terminators Accuracy: Provide the data needed to yield single sounding estimates of XCO2 with one sigma errors of <= 2 ppm
Spectrometer (OCO-3) NASA (JAXA)	OCO-3	Being developed	Atmospheric chemistry	Global measurements of atmospheric CO2 needed to describe the variability of CO2 sources and sinks.	Waveband: 0.765 µm, 1.61 µm, 2.06 µm Spatial resolution: 2.25 km downtrack by 0.7 km cross-track Swath width: Soundings ≤ 3 km2 in area during Nadir Observation Accuracy: provide single sounding estimates of XCO2 with one sigma errors of <= 2 ppm
Spectrometer (TEMPO) NASA	TEMPO	Being developed	Atmospheric chemistry	Hourly measurements of air pollution over North America, from Mexico City to the Canadian oil sands, at high spatial resolution. Measurements in ultraviolet and visible wavelengths will provide a suite of products including the key elements of tropospheric air pollution chemistry. Will be part of the first global geostationary constellation for pollution monitoring, along with European and Korean missions now in development.	Waveband: 290 to 750 nm (TBC) Spatial resolution: 2 km by 4.5 km at at geodetic location 36.5° N, 100° W Swath width: From 18 degrees N to 58 degrees N Accuracy: Precisions include tropospheric O3 to 10 ppbv in 1 hour, tropospheric NO2 to 1x1015 molecules cm-2 in 1 hour, tropospheric H2CO to 1x1016 molecules cm-2 in 3 hours, tropospheric SO2 to 1x1016 molecules cm-2 in 3 hours, and aerosol optical depth to 0.10 in 1 hour, all geo-located to an accuracy of 4 km.
SRAL SAR Radar Altimeter ESA (EC)	Sentinel-3 A, Sentinel-3 B, Sentinel-3 C	Approved	Radar altimeters	Marine and land services.	Waveband: Dual freq radar altimeter, Ku-band, C-band Spatial resolution: 300 m Swath width: Profiling Accuracy: 3 cm in range (1 s average, 2 m SWH including atm. corrections)
SSB/X-2 Special Sensor Gamma Ray Particle Detector NOAA (DoD (USA))	DMSP F-14	Operational	Space environment	Detects the location, intensity, and spectrum of X-rays emitted from the Earth's atmosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
SSI/ES-2 Special Sensor Ionospheric Plasma Drift/Scintillation Meter NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Space environment	Measurement of the ambient electron density and temperatures, the ambient ion density, and ion temperature and molecular weight.	Waveband: Spatial resolution: Swath width: Accuracy:
SSI/ES-3 Special Sensor Ionospheric Plasma Drift/Scintillation Meter NOAA (DoD (USA))	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Space environment	Measurement of the ambient electron density and temperatures, the ambient ion density, and ion temperature and molecular weight.	Waveband: Spatial resolution: Swath width: Accuracy:
SSJ/4 Special Sensor Precipitating Plasma Monitor NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Magnetic field	Measurement of transfer energy, mass, and momentum of charged particles through the magnetosphere-ionosphere in the Earth's magnetic field.	Waveband: Spatial resolution: Swath width: Accuracy:
SSJ/5 Special Sensor Precipitating Plasma Monitor NOAA (DoD (USA))	DMSP F-16	Operational	Magnetic field	Measurement of transfer energy, mass, and momentum of charged particles through the magnetosphere-ionosphere in the Earth's magnetic field.	Waveband: Spatial resolution: Swath width: Accuracy:
SSM Special Sensor Magnetometer NOAA (DoD (USA))	DMSP F-14, DMSP F-15, DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Magnetic field	Measures geomagnetic fluctuations associated with solar geophysical phenomena. With SSIES and SSJ provides heating and electron density profiles in the ionosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
SSM/I Special Sensor Microwave Imager NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Imaging multi-spectral radiometers (passive microwave)	Measures atmospheric, ocean and terrain microwave brightness temperatures to provide: sea surface winds, rain rates, cloud water, precipitation, soil moisture, ice edge, ice age.	Waveband: Microwave: 19.35 GHz, 22.235 GHz, 37 GHz, 85 GHz Spatial resolution: 15.7 x 13.9 km to 68.9 x 44.3 km (depends on frequency) Swath width: 1400 km Accuracy:
SSM/IS Special Sensor Microwave Imager Sounder NOAA (DoD (USA))	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Atmospheric temperature and humidity sounders	Measures thermal microwave radiation. Global measurements of air temp profile, humidity profile, ocean surface winds, rain overland/ocean, ice concentration/age, ice/snow edge, water vapour/clouds over ocean, snow water content, land surface temperature.	Waveband: Microwave: 19 - 183 GHz (24 frequencies) Spatial resolution: Varies with frequency: 25 x 17 km to 70 x 42 km Swath width: 1700 km Accuracy:
SSM/T-1 Special Sensor Microwave Temperature Sounder NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Atmospheric temperature and humidity sounders	Measures Earth's surface and atmospheric emission in the 50 - 60 GHz oxygen band.	Waveband: Microwave: 7 channels in the 50 - 60 GHz range Spatial resolution: 174 km diameter beam Swath width: 1500 km Accuracy:
SSM/T-2 Special Sensor Microwave Water Vapor Sounder NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Atmospheric temperature and humidity sounders	Water vapour profiler.	Waveband: Microwave: 91.6, 150, 183.31 (3 channels) (Total 5 channels) Spatial resolution: Approx 48 km Swath width: 1500 km Accuracy:
SSULI Special Sensor Ultraviolet Limb Imager NOAA	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Space environment	Measures vertical profiles of the natural airglow radiation from atoms, molecules and ions in the upper atmosphere and ionosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
SSUSI Special Sensor Ultraviolet Spectrographic Imager NOAA	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Space environment	Monitors the composition and structure of the upper atmosphere and ionosphere, as well as auroral energetic particle inputs, with spectrographic imaging and photometry.	Waveband: Spatial resolution: Swath width: Accuracy:
STR Star Tracker Set (3) ESA	Swarm	Operational	Precision orbit	Precise attitude determination from the combination of two or three star trackers.	Waveband: N/A Spatial resolution: <1 arcsec Swath width: N/A Accuracy: < 3 arcsec pointing accuracy around all STR axes
SUVI Solar Ultraviolet Imager NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Other	The SUVI will monitor the entire dynamic range of solar x-ray features, including coronal holes and solar flares, and will provide quantitative estimates of the physical conditions in the Sun’s atmosphere.	Waveband: Spatial resolution: Swath width: Accuracy:

SWIM Surface Waves Investigation and Monitoring CNES	CFOSAT	Approved	Scatterometers	Ku-band Real-aperture radar (RAR) system, multi-incindence beams(0-10°) and azimuth scanning. Measurement of 2D ocean waves spectrum	Waveband: Ku-band Spatial resolution: 50x50km on 2D spectra Swath width: 140 km Accuracy: accuracy for wave estimates: minimum detectable wavelength of about 70 m, maximum detectable wavelength about 500m, accuracy in wave propagation direction of about 15°, accuracy in wavelength of 10 to 20%, accuracy in significant wave height of 10% or better than 40-50 cm (TBC)
SXI Solar X-ray Imager NOAA (USAF)	GOES-13, GOES-14, GOES-15	Operational	Space environment	Obtains data on structure of solar corona. Full disk imagery also provides warnings of geomagnetic storms, solar flares, and information on active regions of sun and filaments.	Waveband: Spatial resolution: Swath width: Accuracy:
TANSO-CAI Thermal And Near infrared Sensor for carbon Observation - Cloud and Aerosol Imager JAXA (MOE (Japan), NIES (Japan))	GOSAT	Operational	Imaging multi-spectral radiometers (vis/IR)	Detection and correction of cloud and aerosol for TANSO-FTS.	Waveband: 0.380 µm, 0.674 µm, 0.870 µm, 1.60 µm Spatial resolution: 0.5 km (0.380, 0.674, 0.870 µm bands), 1.5 km (1.62 µm band) Swath width: 1000 km (0.380 µm, 0.678 µm, 0.870 µm bands), 750 km (1.62 µm band) Accuracy:
TANSO-CAI-2 Thermal And Near infrared Sensor for carbon Observation - Cloud and Aerosol Imager-2 JAXA (MOE (Japan), NIES (Japan))	GOSAT-2	Being developed	Imaging multi-spectral radiometers (vis/IR)	Detection and correction of cloud and aerosol for TANSO-FTS, aerosol characteristics	Waveband: 0.343 µm, 0.443 µm, 0.674 µm, 0.869 µm, 1.63 µm / tilt angle +20deg. 0.380 µm, 0.550 µm, 0.674 µm, 0.869 µm, 1.63 µm / tilt angle -20deg. Spatial resolution: 0.5 km (0.343, 0.443, 0.674, 0.869, 0.380, 0.550, 0.674, 0.869 µm bands), 1.0 km (1.63 µm band) Swath width: 1000 km Accuracy:
TANSO-FTS Thermal And Near infrared Sensor for carbon Observation - Fourier Transform Spectrometer JAXA (MOE (Japan), NIES (Japan))	GOSAT	Operational	Atmospheric temperature and humidity sounders and atmospheric chemistry	CO2 and CH4 distribution.	Waveband: 0.758 - 0.775 µm, 1.56 - 1.72 µm, 1.92 - 2.08 µm, 5.56 - 14.3 µm Spatial resolution: 10.5 km Swath width: 160 km Accuracy:
TANSO-FTS-2 Thermal And Near infrared Sensor for carbon Observation - Fourier Transform Spectrometer-2 JAXA (MOE (Japan), NIES (Japan))	GOSAT-2	Being developed	Atmospheric temperature and humidity sounders	CO2, CH4, and CO distribution.	Waveband: 0.754 - 0.772 µm, 1.56 - 1.19 µm, 1.92 - 2.38 µm, 5.55 -8.41 µm, 8.41 - 14.3 µm Spatial resolution: 9.7km Swath width: 160km Accuracy:
TDP Technological Development Package CONAE	SAC-D/Aquarius	Operational	Precision orbit	Develop, test, and operate the Technological Demonstration Package (TDP) for demonstrating a newly developed GPS receiver for position, velocity, and time determination and an Inertia Reference Unit (IRU) to measure inertial angular velocity.	Waveband: Spatial resolution: Swath width: Accuracy:
TES Tropospheric Emission Spectrometer NASA	Aura	Operational	Atmospheric chemistry	3D profiles on a global scale of all infra-red active species from surface to lower stratosphere. Measures greenhouse gas concentrations, tropospheric ozone, acid rain precursors, gas exchange leading to stratospheric ozone depletion.	Waveband: SWIR-TIR: 3.2 - 15.4 µm Spatial resolution: In limb mode: 2.3 km vertical resolution. In down-looking mode: 50 x 5 km (global), 5 x 0.5 km (local) Swath width: Limb mode: global: 50 x 180 km, local: 5 x 18 km Accuracy: Ozone: 20 ppb, Trace gases: 3 - 500 ppb
TGRS TriG (Tri-GNSS) GNSS Radio-occultation System NOAA, NSPO (UCAR)	COSMIC-2	Proposed		TGRS is the radio occultation receiver, which will receive signals from GPS, Galileo, and Glonass.	Waveband: Spatial resolution: Swath width: Accuracy:
TGSP Trace Gas Spectrometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Atmospheric chemistry	Trace gas measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
TIM Total Irradiance Monitor NASA	SORCE, TCTE	Operational	Earth radiation budget radiometers	Measurement of total solar irradiance directly traceable to SI units with an absolute accuracy of 0.03% and relative accuracy of 0.001% per year.	Waveband: Spatial resolution: Swath width: Looks at the sun every orbit, providing 15 measurements per day Accuracy:
TIR Two band Thermal Infrarred Camera CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Approved	Imaging multi-spectral radiometers (vis/IR)	Sea surface temperature measurement	Waveband: TIR 2 bands: 10800 - 11800 nm Spatial resolution: 400m - 800 m Swath width: 1350 km Accuracy:
TIR (Oceansat-3) Thermal Infrared Radiometer (Oceansat-3) ISRO	OCEANSAT-3	Being developed	Imaging multi-spectral radiometers (vis/IR)	TIR and OCM combination will support joint analysis for operational potential fishing zones.	Waveband: 2 bands Spatial resolution: 1080 m Swath width: 1500 km Accuracy:
TIRS Thermal Infrared Sensor USGS (NASA)	Landsat 8	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures surface radiance and emittance, lands cover state and change (eg vegetation type). Used as multipurpose imagery for land applications.	Waveband: TIR 10.5 µm and 12 µm Spatial resolution: 100 m Swath width: 185 km Accuracy:
TMI TRMM Microwave Imager NASA	TRMM	Operational	Imaging multi-spectral radiometers (passive microwave)	Measures rainfall rates over oceans (less reliable over land), combined rainfall structure and surface rainfall rates with associated latent heating. Used to produce monthly total rainfall maps over oceans.	Waveband: Microwave: 10.7 GHz, 19.4 GHz, 21.3 GHz, 37 GHz, and 85.5 GHz Spatial resolution: Vertical: 2.5 km approx; Horizontal: 18 km Swath width: 790 km Accuracy: Liquid water: 3 mg/cm3, Humidity: 3 mg/cm3, Ocean wind speed: 1.5 m/s
TOU/SBUS Total Ozone Unit & Solar Backscatter Ultraviolet Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Atmospheric temperature and humidity sounders	Ozone total column vertical profile measurements.	Waveband: TOU: 6 channels in the range 308 - 360 nm, SBUS: in the range 252 - 340 nm Spatial resolution: TOU: 50 km total ozone, SBUS: 200 km total ozone Swath width: TOU: 3000 km, SBUS: nadir only Accuracy: 50km
TriG TriG Receiver for Radio Occultation NOAA (ESA, NASA)	Sentinel-6 A, Sentinel-6 B	Being developed			Waveband: Spatial resolution: Swath width: Accuracy:
TSI NSC	Norsat-1	Proposed			Waveband: Spatial resolution: Swath width: Accuracy:
TSIS-1 Total Solar and Spectral Irradiance Sensor 1 NOAA (NASA)	SIDAR, TSIS-on-ISS	Being developed	Earth radiation budget radiometers	0.2 - 2 µm solar spectral irradiance monitor and total spectra monitor	Waveband: UV - SWIR: 0.2 - 2 µm and total spectra Spatial resolution: Swath width: Accuracy: 1.5 w/m2
TSX-NG X-Band SAR DLR	TSX-NG	Proposed	Imaging microwave radars	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: 9.65 GHz, up to 1200 MHz bandwidth, fully polarimetric Spatial resolution: HR Spotlight: 0.25 x 0.25 m, HR Stripmap: 0,5 x 1 m, Stripmap: 1 x 1 m ScanSAR: 10 - 25 x 25 m Swath width: HR Spotlight: 5 km x 10 km, HR Stripmap: 10 km Stripmap: 30 km, ScanSAR: up to 600 km Accuracy:
UV Spectrometer (GACM) NASA	GACM	Proposed	Atmospheric chemistry	Daytime measurements of O3, NO2, SO2, CH2O, and aerosols.	Waveband: 305 - 320 nm and 500 - 650 nm Spatial resolution: Swath width: Accuracy:

UV-VIS Multi-spectral Optical Camera ultraviolet_visible CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Approved	Ocean colour instruments	Ocean Colour - Open ocean, coastal & in-land waters.	Waveband: Ultraviolet-Vissible-NearInfraRed 11 bands- 380 - 412 - 443 - 490 - 531 - 555 - 620 - 665 - 680 - 710 - 865 nm Spatial resolution: 200m - 800 m Swath width: 1350 km Accuracy:
UV/Vis Near IR Wide Imaging Spectrometer (Geo-Cape) NASA	GEO-CAPE	Proposed	Imaging multi-spectral radiometers (vis/IR)	Measures natural and human-produced gases and aerosols in the atmosphere, including those that react in sunlight to form polluting low-level ozone.	Waveband: 315 - 600 nm Spatial resolution: 7 km spatial resolution, single layer vertical resolution, 0.9 nm spectral resolution Swath width: typically uses 2D data array with 1-D north to south in space (7 km wide) and 1D for (oversampled) spectral intervals/bins. The spatial domain is mechanically scanned for east to west to cover a continental domain (either north or south America). Accuracy: ozone precision: 1.3 x 10^16 cm^(-2); NO2 precision: 5 x 10^14 cm^(-2)
UVAS UVAS (Ultraviolet Visible and near-infrared Atmospheric Sounder) CDTI	Ingenio	Being developed	Atmospheric chemistry	High spatial resolution observations of air quality and climate gases such as ozone (O3), nitrogen dioxide (NO2), sulphur dioxide (SO2), formaldehyde (HCHO) glyoxal (CHO-CHO), and aerosols over selected zones of interest (urban and industrialized areas, mayor motorways, and special events like forest fires, volcano eruption and sand storms). Also measurements of halogenated compounds will be performed, including bromine monoxide (BrO) and iodine monoxide (IO).	Waveband: UV/VIS 290 - 490 nm Spatial resolution: 20 km nominal, 10 km zoom. Swath width: Accuracy: trace gas profile 10 - 40%
UVN UV-VIS-NIR Sounder EUMETSAT (ESA)	MTG-S1 (sounding), MTG-S2 (sounding)	Approved	Atmospheric chemistry	Measurements of atmospheric trace gases, mainly O3, NO2, SO2, H2CO. The product list is not yet approved, the accuracy summary column lists the breakthrough user requirements.	Waveband: UV-1: 290 - 308 nm, UV-2: 308 - 400 nm, VIS: 400 - 500 nm, NIR: 750 - 775 nm Spatial resolution: < 5 km at SSP, possibly relaxed to 50 km for wavelengths < 308 nm Swath width: FOV E-W: 30°W-45°E @ 40°N, N-S: 30°N-65°N Accuracy: H2CO: 50%, NO2: 50%, O3: 10%, SO2: 50%
UVN (Sentinel-4) UV-visible- near infrared imaging spectrometer (Sentinel-4) ESA (EC)	Sentinel-4 A, Sentinel-4 B	Proposed	Atmospheric chemistry	Supporting atmospheric composition and air quality monitoring services.	Waveband: UV-1: 290 - 308 nm, UV-2: 308 - 400 nm, VIS: 400 - 500 nm, NIR: 750 - 775 nm Spatial resolution: < 5 km at SSP, possibly relaxed to 50 km for wavelengths < 308 nm Swath width: FOV E-W: 30°W-45°E @ 40°N, N-S: 30°N-65°N Accuracy: TBD
UVNS (Sentinel-5 precursor) Ultra-violet Visible Near-infrared Shortwave-infrared spectrometer ESA (EC, NSO)	Sentinel-5 precursor	Proposed	Atmospheric chemistry	Supporting atmospheric composition and air quality monitoring services.	Waveband: UV-1: 270 - 300 nm, UV-2: 300 - 400 nm, VIS: 400 - 500 nm, NIR: 710 - 775 nm, SWIR-3: 2305 - 2385 nm Spatial resolution: 5 - 15 km at SSP, possibly relaxed to 50 km for wavelengths < 300 nm Swath width: Daily global coverage Accuracy: TBD
UVNS (Sentinel-5) Ultra-violet Visible Near-infrared Shortwave-infrared spectrometer ESA (EC)	Sentinel-5	Proposed	Atmospheric chemistry	Supporting atmospheric composition and air quality monitoring services.	Waveband: UV-1: 270 - 300 nm, UV-2: 300 - 400 nm, VIS: 400 - 500 nm, NIR: 710 - 775 nm, SWIR-1: 1593 - 1672 nm, SWIR-2: 1940 - 2030 nm, SWIR-3: 2305 - 2385 nm Spatial resolution: 5 - 15 km at SSP, possibly relaxed to 50 km for wavelengths < 300 nm Swath width: Daily global coverage Accuracy: TBD
VEGETATION CNES (SNSB, EC)	SPOT-5	Operational	Imaging multi-spectral radiometers (vis/IR)	Data of use for crop forecast and monitoring, vegetation monitoring, and biosphere/ geosphere interaction studies.	Waveband: Operational mode: VIS: 0.61 - 0.68 µm, NIR: 0.78 - 0.89 µm, SWIR: 1.58 - 1.75 µm, Experimental mode: VIS: 0.43 - 0.47 µm Spatial resolution: 1.15 km at nadir - minimal variation for off-nadir viewing Swath width: 2200 km Accuracy:
Vegetation ESA	PROBA-V	Operational	Imaging multi-spectral radiometers (vis/IR)	Global coverage every two days for uses including climate impact assessments, surface water resource management, agricultural monitoring, and food security estimates.	Waveband: Equivalent spectral bands to Spot Vegetation: VNIR: Blue (438-486 nm), Red (615-696 nm), Near IR (772-914 nm), SWIR (1564-1634 nm). Spatial resolution: 100 m resolution at Nadir, 350 m on full field of view Swath width: 102° field of view with 2250 km wide swath Accuracy:
VFM Vector Field Magnetometer ESA	Swarm	Operational	Magnetic field	Magnetic field vector measurements.	Waveband: N/A Spatial resolution: <0.1nT Swath width: N/A Accuracy: <0.5 nT/15 days
VHR PAN Camera and MS Camera Very High Resolution Panchromatic Camera and Multi-Spectral Camera ASI	OPSIS	Proposed	High resolution optical imagers	Land use, risk, agriculture and forestry, topographic mapping and cartography, vegetation and agriculture, natural resources, security, cultural heritage.	Waveband: PAN = 450-900 nm; BLUE = 450-520 nm; GREEN = 520-600 nm; RED = 630-690 nm; NIR = 760-900 nm Spatial resolution: PAN = 0.5 m; MS = 2 m Swath width: 10 km x 10 km Accuracy:
VHRR Very High Resolution Radiometer ISRO	INSAT-3A, KALPANA-1	Operational	Imaging multi-spectral radiometers (vis/IR)	Cloud cover, rainfall, wind velocity, sea surface temperature, outgoing longwave radiation, reflected solar radiation in spectral band 0.55 - 0.75 µm, emitted radiation in 10.5 - 12.5 µm range.	Waveband: VIS: 0.55 - 0.75 µm, NIR: 5.7 - 7.1 µm, TIR: 10.5 - 12.5 µm Spatial resolution: 2 km in visible, 8 km in IR Swath width: Full Earth disk every 30 minutes Accuracy:
VIIRS Visible/Infrared Imager Radiometer Suite NOAA (NASA)	DWSS, JPSS-1, JPSS-2, Suomi NPP	Operational	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Global observations of land, ocean, and atmosphere parameters: cloud/weather imagery, sea-surface temperature, ocean colour, land surface vegetation indices.	Waveband: VIS - TIR: 0.4 - 12.5 µm (22 channels) Spatial resolution: 400 m - 1.6 km Swath width: 3000 km Accuracy: SST 0.35 K
VIRR Multispectral Visible and Infra-red Scan Radiometer (10 channels) NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Imaging multi-spectral radiometers (vis/IR)	Multispectral Visible and Infra-red Scan Radiometer.	Waveband: Instrument features 10 channels over 0.43 - 10.5 µm Spatial resolution: 1.1 km at nadir Swath width: 2800 km Accuracy: 1.1 km
Visible imaging spectrometer (HysplRI) NASA	HysplRI	Proposed	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)		Waveband: 400 - 2500 nm Spatial resolution: 60 m at nadir; 3 week revisit time Swath width: 90 km Accuracy: Spectral accuracy < .5 nm
VNREDSat 1 HS VNREDSat 1 Hyperspectral VAST	VNREDSat 1b	Proposed	Hyperspectral imagers	The VNREDSat 1b hyperspectral instrument is designed for land cover measurements and applications.	Waveband: Hyperspectral NIR. Spatial resolution: Swath width: Accuracy:
VNREDSat 1 MS VNREDSat 1 Multispectral VAST	VNREDSat 1	Operational	Imaging multi-spectral radiometers (vis/IR)	The VNREDSat 1 multispectral instrument is designed for land cover measurements and applications.	Waveband: There are 4 bands of multispectral, visible and infrared and panchromatic Spatial resolution: MS bands: 10m; panchromatic 2.5m Swath width: 17.5 km Accuracy:
VSC Venus Superspectral Camera CNES (ISA)	VENUS	Being developed	Imaging multi-spectral radiometers (vis/IR)	High resolution superspectral images (12 spectral bands) for vegetation and landcover applications.	Waveband: 420 nm centre wavelength (width: 40 nm); 443 nm (40); 490 nm (40); 555 nm (40); 620 nm (40); 620 nm (40); 667 nm (30); 702 nm (24); 742 nm (16); 782 nm (16); 865 nm (40); 910 nm (20) Spatial resolution: 5.3 m spatial resolution with 27 km swath Swath width: 27 km Accuracy:
WFC Wide Field Camera NASA	CALIPSO	Operational	Imaging multi-spectral radiometers (vis/IR)	Acquires high spatial resolution imagery with CALIPSO for meteorological context.	Waveband: VIS: 620 to 670 nm Spatial resolution: 125 m Swath width: 61 km Accuracy:
WFI-2 (Amazonia-1) Wide Field Imager-2 (Amazonia-1) INPE	AMAZONIA-1	Approved	Imaging multi-spectral radiometers (vis/IR)	Used for fire extent detection measurement, coastal and vegetation monitoring, land cover and land use mapping. WFI-2 (Amazonia-1) is the same instrument as WFI-2 (CBERS), however due differences in orbital altitude, they have different spatial resolutions.	Waveband: VIS: 0.45 - 0.50 µm, 0.52 - 0.57 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: VIS - NIR: 60 m Swath width: 740 km Accuracy:
WFI-2 (CBERS) Wide Field Imager-2 (CBERS) INPE (CAST)	CBERS-4	Operational	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use. WFI-2 (Amazonia-1) is the same instrument as WFI-2 (CBERS), however due differences in orbital altitude, they have different spatial resolutions.	Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm; 0.77 - 0.89 µm Spatial resolution: 64 m Nadir Swath width: 866 km Accuracy:

WindRAD Wind Radar NSMC-CMA	FY-3E, FY-3G	Prototype	Scatterometers	Measures sea-surface wind.	Waveband: C and Ku band. Spatial resolution: Swath width: Accuracy:
WSAR NSOAS (CAST)	HY-3A, HY-3B, HY-3C	Proposed	Imaging microwave radars	High resolution radar measurements of land and ocean features.	Waveband: X-Band: 8 - 12 GHz Spatial resolution: 3 modes: 1 m, 5 m, 10 m Swath width: 3 swaths: 40 km, 80 km, 150 km Accuracy:
X-Band SAR X-Band Synthetic Aperture Radar DLR	TanDEM-X, TerraSAR-X	Operational	Imaging microwave radars	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: 9.65 GHz, 300 MHz bandwidth, all 4 polarisation modes Spatial resolution: Spotlight: 1.2 x 1 - 4 m Stripmap: 3 x 3 - 6 m ScanSAR: 16 x 16 m Swath width: Spotlight: 5-10km x 10 km, Stripmap: 30 km, ScanSAR: 100 km Accuracy:
XPS XUV Photometer System NASA	SORCE	Operational	Other	Objective is to measure the extreme UV solar irradiance from 1 - 35 nm.	Waveband: UV: 1 - 35 nm Spatial resolution: Swath width: Accuracy:
