

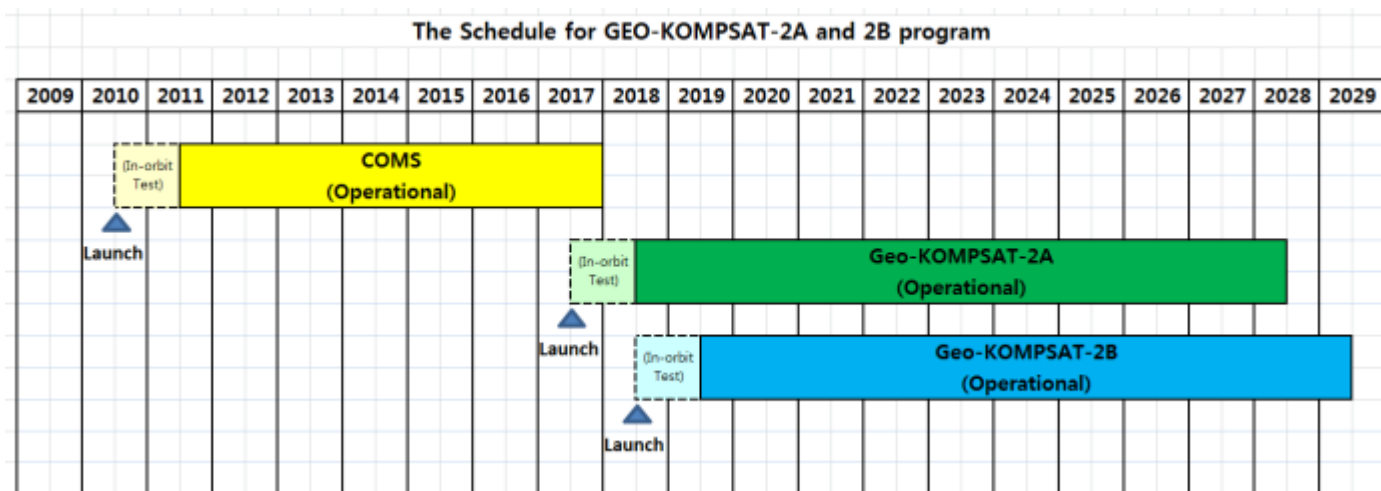
Status report on the current and future satellite systems by KMA

Presented to CGMS-40 plenary session, agenda item [C.1 or C.2]



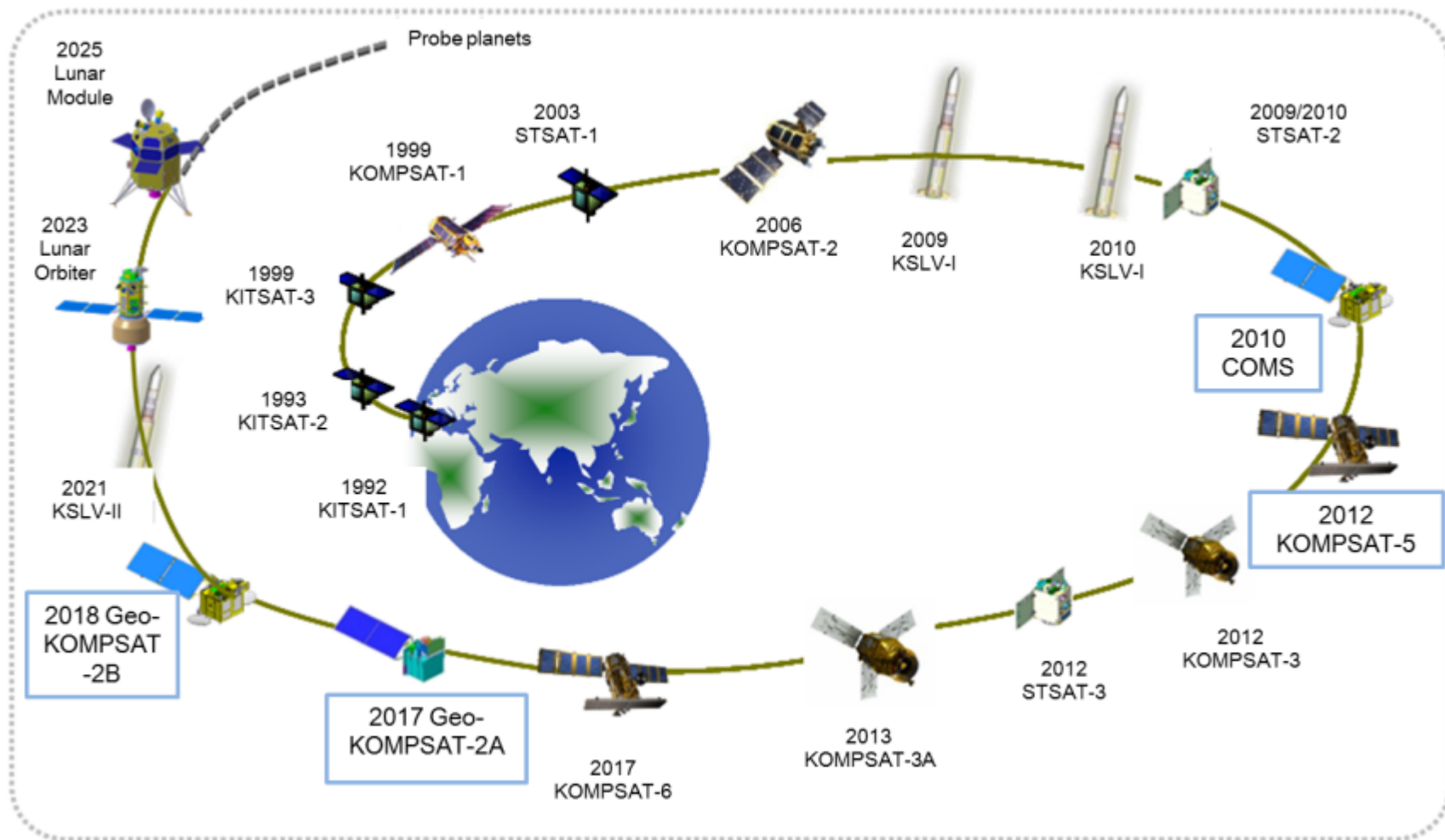
Current and future satellite system

Sector	Satellite in Orbit	Operator	Location	Launch date	Environmental payload and status
West Pacific	COMS	KMA, KIOST	128.2°E	26/06/2010	5-channel VIS/IR Meteorological Imager (MI), Geost. Ocean Colour Imager (GOCI) Direct Broadcast via HRIT/LRIT
	GEO-KOMPSAT-2A	KMA	116.2°E or 128.2°E	2017	Advanced Meteorological Imager (AMI), Space Environmental monitoring payload Direct broadcast via HRIT/LRIT
	GEO-KOMPSAT-2B	MLTM(Ministry of Land, Transport and Maritime Affairs), ME(Ministry of Environment)	116.2°E or 128.2°E	2018	Advanced Geostationary Ocean Colour Imager(GOCI-II), Geostationary Environmental Monitoring Spectrometer(GEMS)



Development of the GEO-KOMPSAT-2

National-Space-Development-Plan



CURRENT GEO SATELLITES

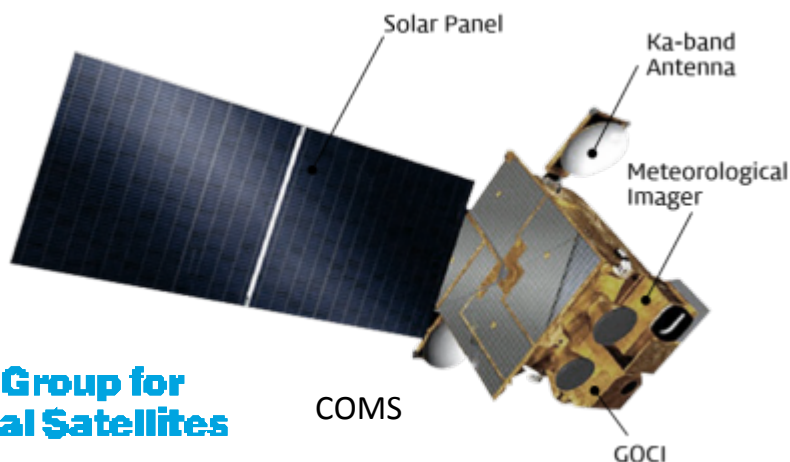
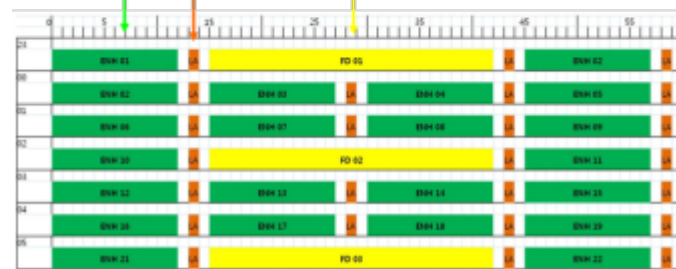
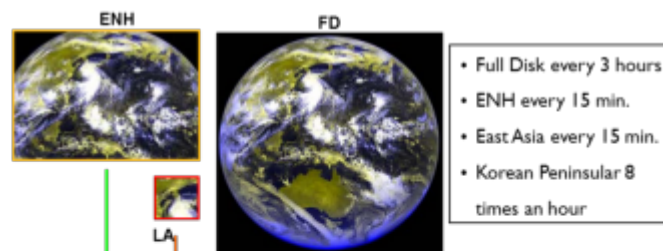
➤ COMS (Communication, Ocean, and Meteorological Satellite)

- Payloads :
 - MI(5-channel VIS/IR Meteorological Imager)
 - GOCI(Geostationary Ocean Color Imager)
- Launch : 26/06/2010
- Orbit : 128.2°E
- Lifetime estimated : 2011 - 2018
- Operator : KMA, KIOST

The channels of COMS/MI

channel	Wave length(μm)
Visible	0.67
Shortwave IR(IR4)	3.7
Water Vapor(IR3)	6.7
IR1	10.8
IR2	12.0

COMS MI Observation Schedule



CURRENT GEO SATELLITES

- COMS MI data Service via Satellite
 - Broadcast to M/SDUSs(Medium/Small-scale Data Utilization Stations)
 - Format : H/LRIT(High/Low Rate Information Transmission)

Classification	HRIT	LRIT
Data Transmission Rate	3 Mbps	512 kbps
Data Types	MI image Alpha numeric text Encryption key message	MI image Alpha numeric text Encryption key message GOI image Satellite meteorological products
Image mode	FD, ENH	FD, ENH
User Station	MDUS	SDUS

- Service via Landline
 - Internal/Cooperation Organization : Intranet, Comprehensive WIS*, Disaster Prevention WIS*
 - General Public : KMA Homepage
 - Expert Group : NMSC Homepage, ftp



CURRENT GEO SATELLITES

➤ COMS MI products

Group	Product Name		Area	Alg. Dev.	Remarks
Scene Analysis	Cloud Detection (CLD)		FD / ENH / LA	NIMR	Apr 2011
	Fog Detection (FOG)		East Asia	NIMR	Apr 2011
	Snow/Sea Ice (SSI)		FD / ENH + comp.	NIMR	Jan 2012
	Aerosol Index (AI)		East Asia	Pusan NU	Apr 2011
	Aerosol Optical Depth (AOD)		East Asia	YSU	Jan 2012
Cloud Information	Cloud Analysis (CLA)	Cloud Type (CT)	FD / ENH / LA	SNU	Apr 2011
		Cloud Amount (CA)	FD / ENH / LA		
		Cloud Phase (CP)	FD / ENH / LA		
		Cloud Optical Thickness (COT)	FD / ENH / LA		
	Cloud Top Temp./Height (CTTH)		FD / ENH / LA	SNU	Apr 2011
Rainfall Intensity (RI)		East Asia / LA	Kangnung NU	Aug 2011	
Watervapor Information	Total Precipitable Water (TPW)		East Asia	Kyoungpook NU	Jan 2012
	Upper Tropospheric Humidity (UTH)		East Asia	Kyoungpook NU	Aug 2011
Surface Information	Sea Surface Temperature (SST)		FD / ENH + comp.	SNU	Aug 2011
	Land Surface Temperature (LST)		East Asia	Kongju NU	Jan 2012
Radiation Information	Clear Sky Radiance (CSR)		FD / ENH	NIMR	Jan 2012
	Insolation (INS)		FD / ENH	Pukyoung NU	Jan 2012
	Outgoing Longwave Radiation (OLR)		FD / ENH + comp.	SNU	Aug 2011
Wind	Atmospheric Motion Vector (AMV)		Enhanced Northern Hemi.	NIMR	Apr 2011

FUTURE GEO SATELLITES

➤ Observation mission(GEO-KOMPSAT-2A)

- Advanced Meteorological Imager (AMI)
 - Multi-channel capacity: 16 channels (including 2~3 visible channels)
 - Spatial resolution: 0.5-1.0 km for visible and 1-2 km for infrared channels
 - Temporal resolution: within 10 minutes for Full Disk observation
 - Flexibility for the regional area selection and scheduling

Channels

	Spatial resolution	Number of observational bands
VIS (<0.7 micron)	0.5 km - 1.0 km	2~3
NIR (0.7-3 micron)	1km - 2 km	2~3
IR (>3 micron)	2 km	9~11
Total Number of Channels		16

Observation Capability

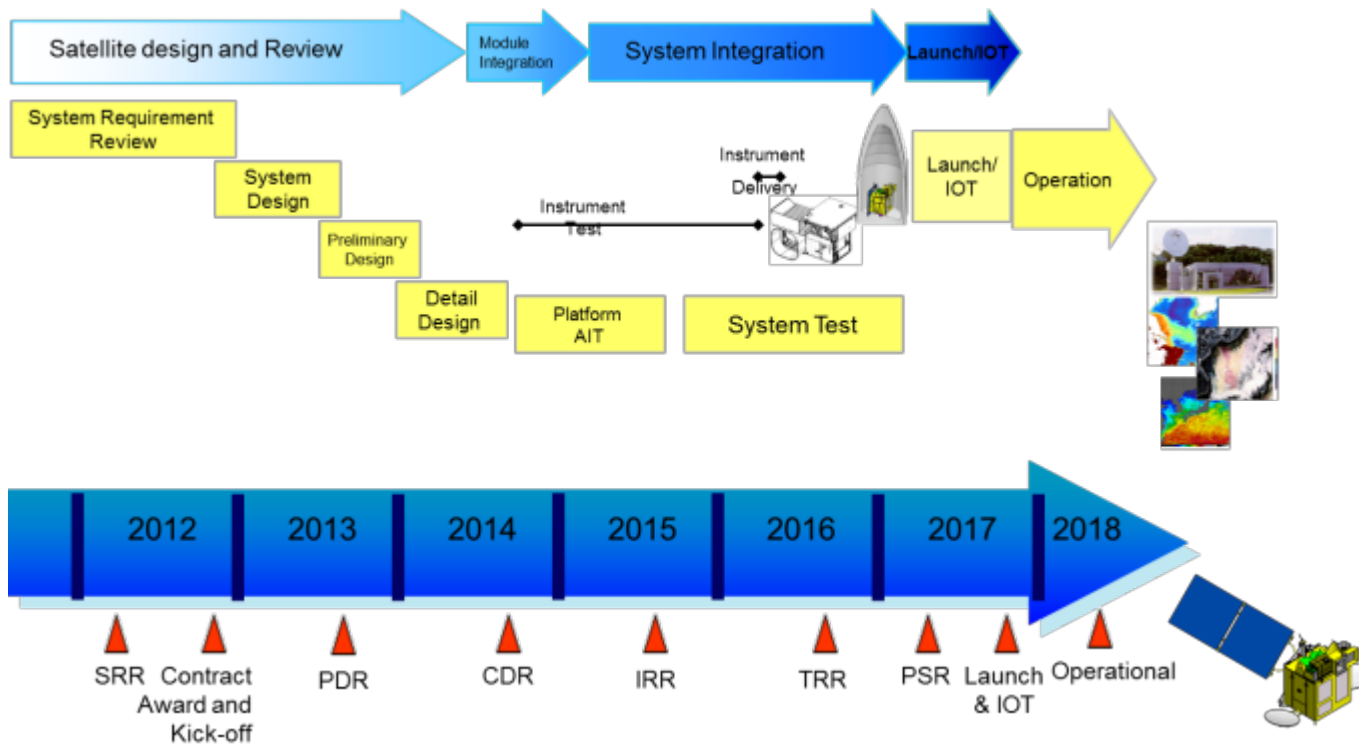
Imaging Rate	< 10 min	(Full Disk)
Scan Capability	Full Disk: normal operation	
	Area: flexible schedule and location definition	

Lifetime of meteorological mission

10 years

FUTURE GEO SATELLITES

➤ GEO-KOMPSAT-2A development plan



FUTURE GEO SATELLITES

- GOCI-II(Geostationary Ocean Colour Imager-II)
 - **the succession and expansion of the mission of GOCI.**
 - 8 times daily regional and 1 time(or 2 times) **daily global observation**
 - higher spatial resolution, **250m×250m, and 12 spectral bands**
 - supporting **user-definable observation requests** such as clear sky area without clouds and special-event areas

	GOCI-I	GOCI-II
Orbit	Geostationary	Geostationary
Channels	8	15 (More)
Special Resolution	500m x 500m	250m x 250m (More detail) 1km x 1km
Covered Area	Local	Local Global (Wider)
S/N	~1000	~1500 (Better)
Observation Frequency	Hourly Daytime	Hourly Daytime (More frequent)



FUTURE LEO SATELLITES

➤ KOMPSAT-5

- The main mission objectives:
 - Acquisition of independent high resolution SAR images, survey of natural resources,
 - Surveillance of large scale disasters and its countermeasure

- Payload of KOMPSAT-5

Payload	Characteristics
COSI	<ul style="list-style-type: none"> • SAR • Multi-mode <ul style="list-style-type: none"> – High Resolution Mode : 1m GR/5km SW – Standard Mode : 3m GR/30km SW – Wide Swath Mode : 20m GR/100km SW • X-band Radar with an active phased array antenna
AOPOD	<ul style="list-style-type: none"> • Dual frequency GPS receiver <ul style="list-style-type: none"> – IGOR : Integrated GPS Occultation Receiver • LRRR(Laser Retro Reflector Array)



FUTURE LEO SATELLITES

- Sun-Synchronous Dawn-Dusk Orbit
 - 550 km mean altitude and 97.6 deg inclination
 - 06:00 AM MLTAN (Mean Local Time of Ascending Node)
 - 15 + 1/28 Rev/Day
 - 28 days repeat ground track (28D421R)
 - Ground Speed of 6.97 km/sec, Nodal Period of 95.78 minutes

- Ground Segment
 - Mission Control Element with S-band RF link to Satellite
 - KARI site in Daejeon
 - S-band site in King Sejong Research Station in South Pole (Urgent Mission)
 - Image data Receiving & Processing Element with X-band RF link to Satellite
 - Calibration and Validation Element

- Launch Plan
 - Launch date : December 2012
 - Direct injection to 550 km sun-synchronous, 6:00 AM MLTAN, 97.6 degree inclination

