



기상청 KOREA
METEOROLOGICAL
ADMINISTRATION

Current Status of COMS MI Operation and its Data Service

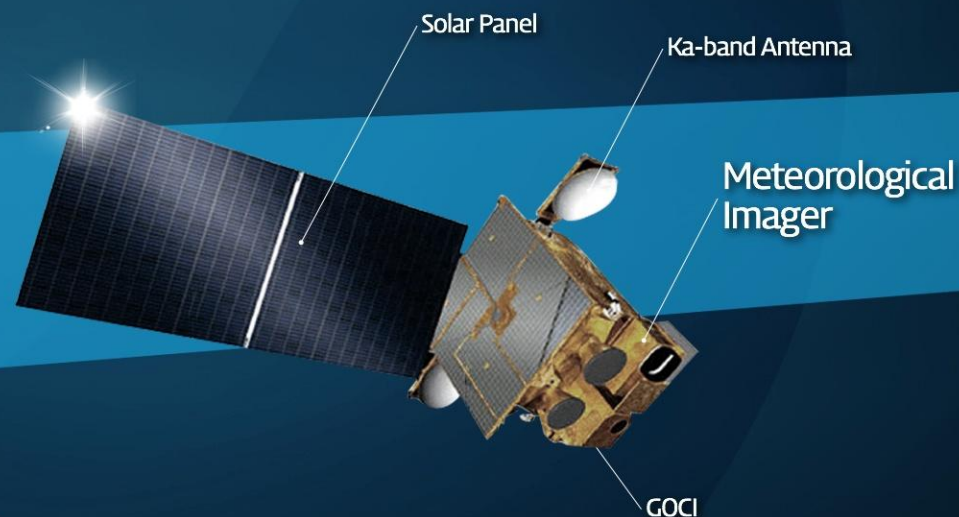
Seung-Hee Sohn
Satellite Operation Division
NMSC/KMA

COMS Development Program

COMS is the first multi-purpose geostationary satellite for Korea in the application of Meteorology, Ocean and Communication

- Meteorological Mission : Continuous Meteorological Observation to support weather forecasting and early detection of severe weather phenomena
- Period : 2003 - 2010 (8 yrs)
- Orbit : 128.2°E over equator (35,000 km)
- Mass : 2,500 kg
- Design life : 7 years

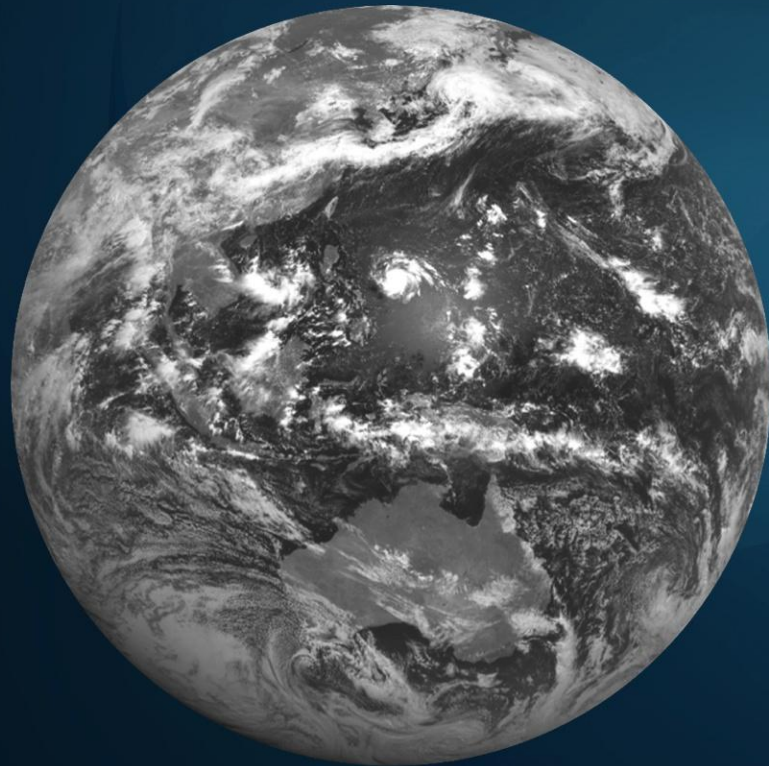
Communication, Ocean and Meteorological Satellite



Channel	Band (μm)	Spatial Resolution (km)	Application
Visible	0.55~0.80	1	Cloud, Dust, Fire, Fog detection
SWIR	3.50~4.0	4	Fog, Low Cloud, Fire detection, LST
WV	6.5~7.0	4	Upper Air Humidity & Temperature
IR1	10.3~11.3	4	Cloud & Dust detection, SST, LST
IR2	11.5~12.5	4	Cloud & Dust detection, SST, LST

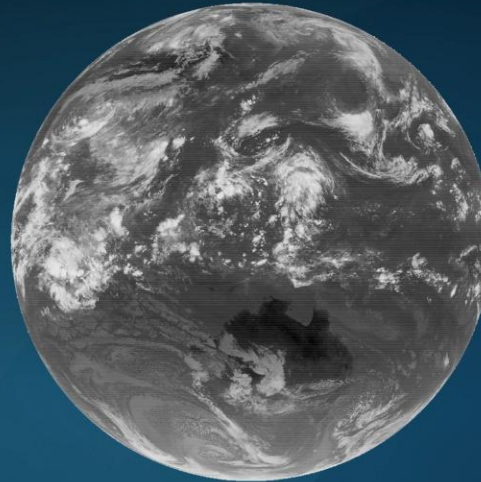
LST : Land Surface Temperature
SST : Sea Surface Temperature

The First COMS Images

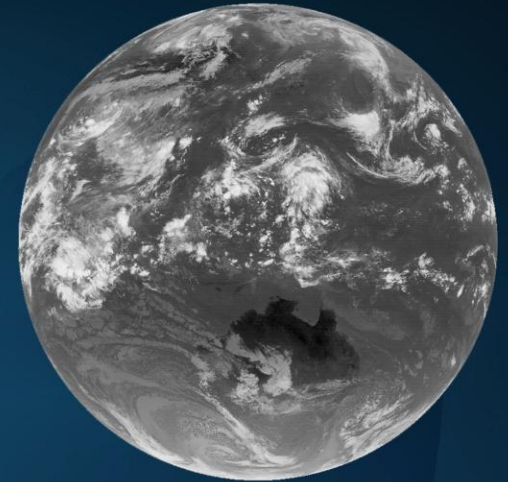


The First Visible Image
(2010. 07. 11 | 11:15 KST)

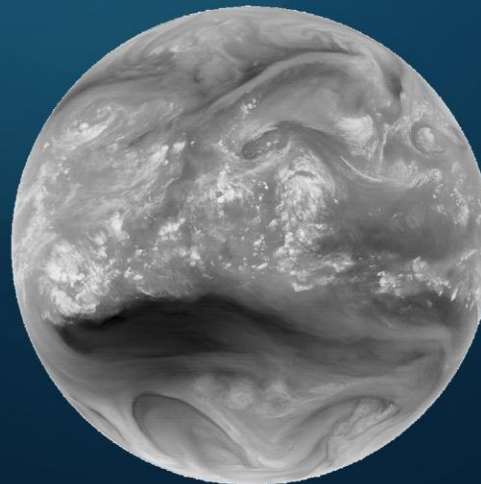
IR1



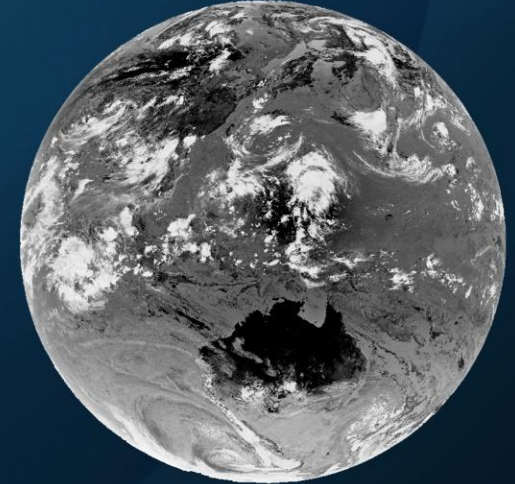
IR2



WV

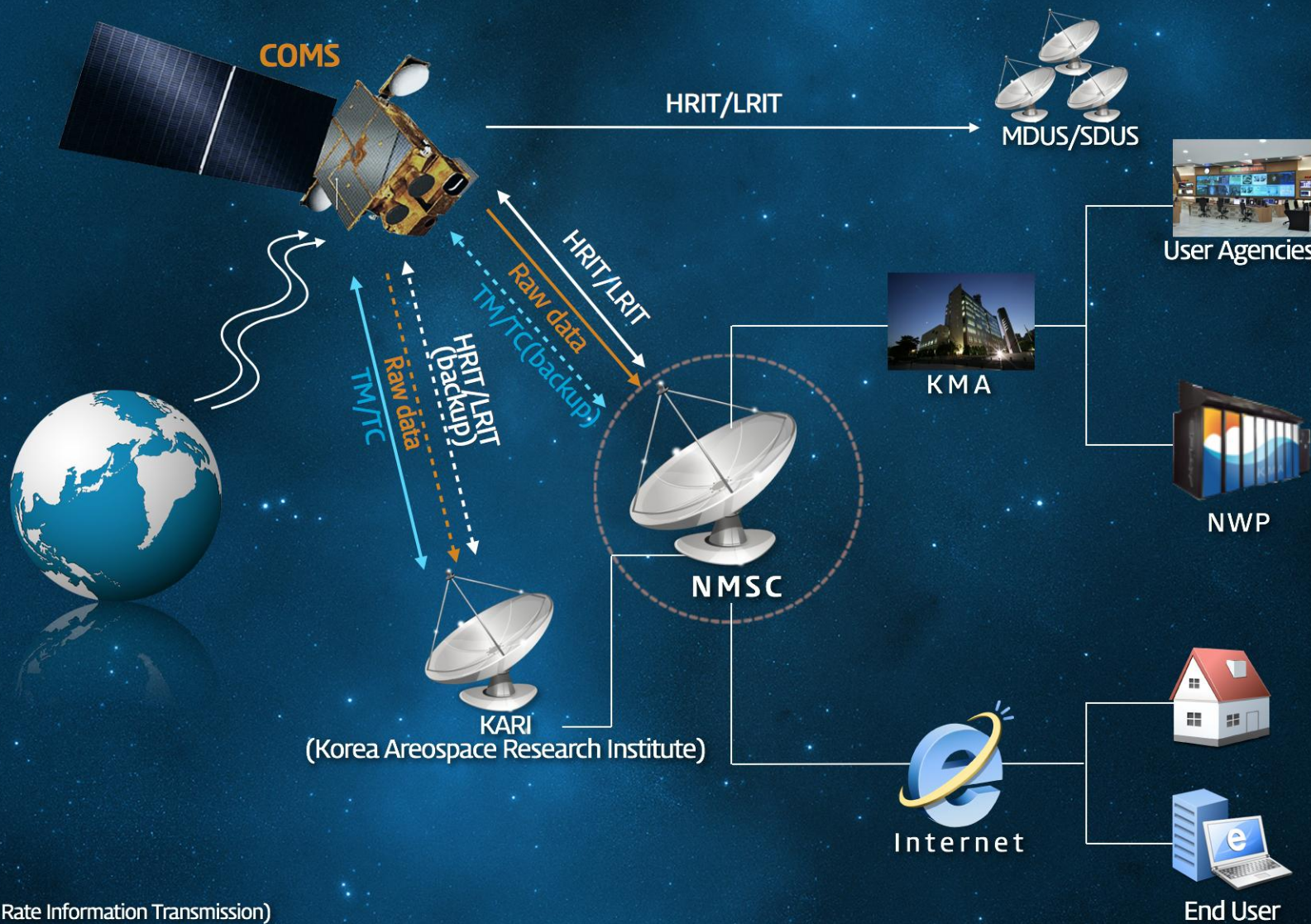


SWIR



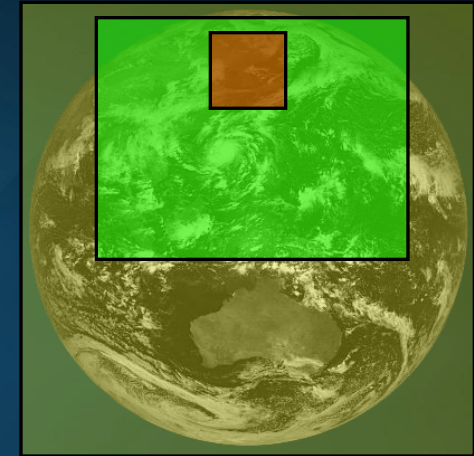
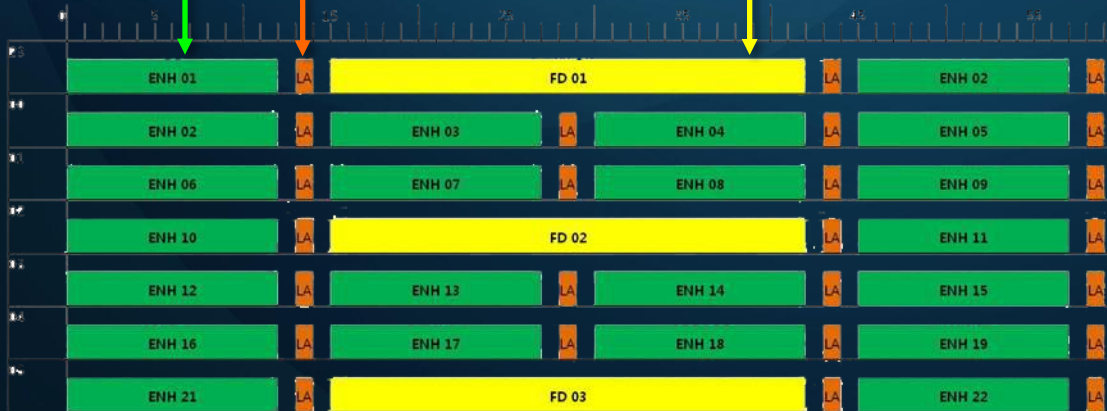
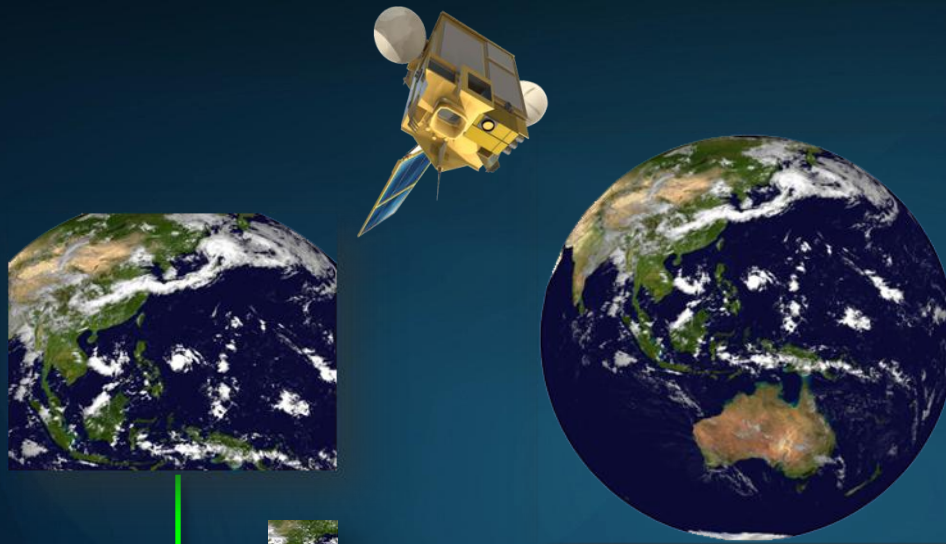
The First Infrared Image
(2010.08.11 | 19:14 KST)

COMS Operation



HRIT (High Rate Information Transmission)
LRIT (Low Rate Information Transmission)

COMS Observation



- Full Disk : Every 3 hrs
- Northern Hemisphere : Every 15min
- Korea Peninsular : 8 time/hr
- Support for early detection of severe weather phenomena

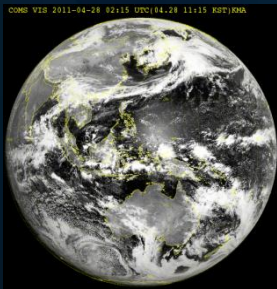
16 Baseline Products : System Development (2003-2010) and (2011~)



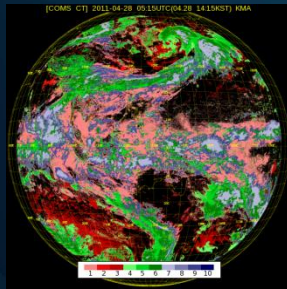
L/HRIT service of COMS MI data

Category	HRIT	LRIT
Data rate	3 Mbps	521 kbps
Data contents	MI images (high res.) Alpha-numeric text Encryption key information	MI images (high res.) Alpha-numeric text Encryption key information Level 2 products GOCI images (3 images / day)
Station	MDUS	SDUS
Encryption	Yes	Yes

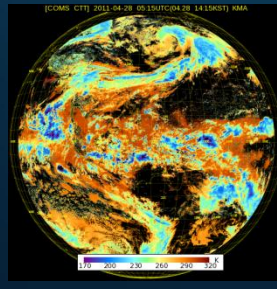
Example of LRIT data



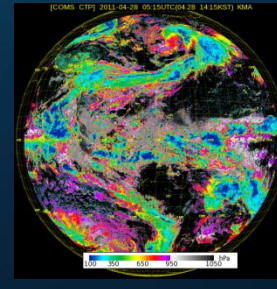
VIS image



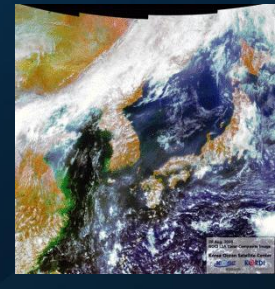
Cloud
Detection



Cloud Top
Temperature

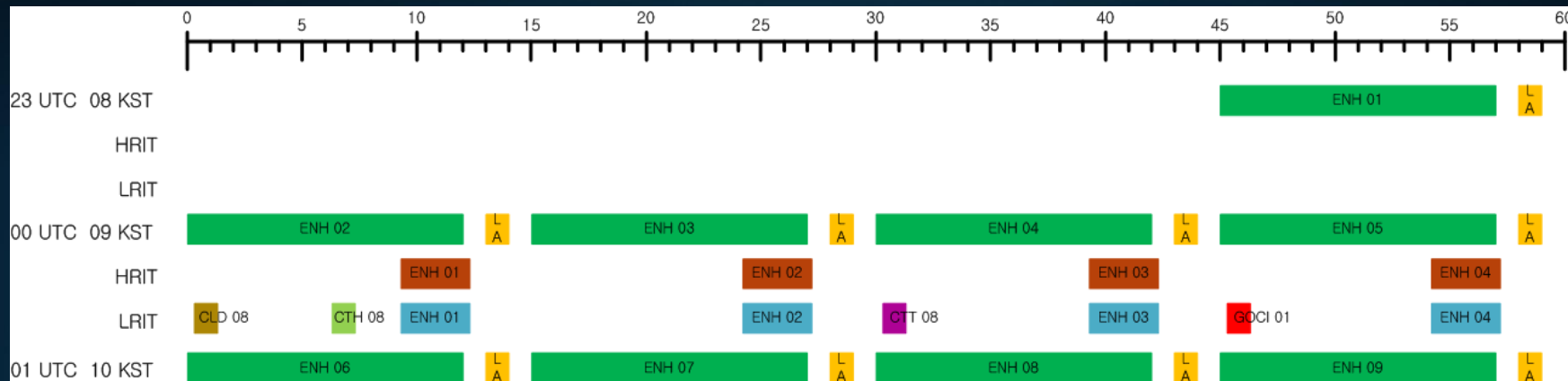


Cloud Top
Pressure



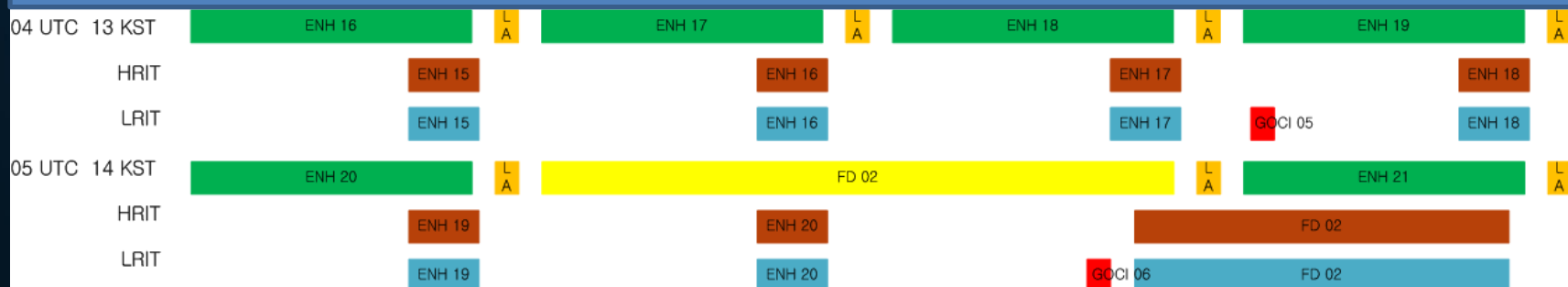
GOCI image

COMS L/HRIT Dissemination Schedule



COMS MI Schedule Modification for Satellite Operation

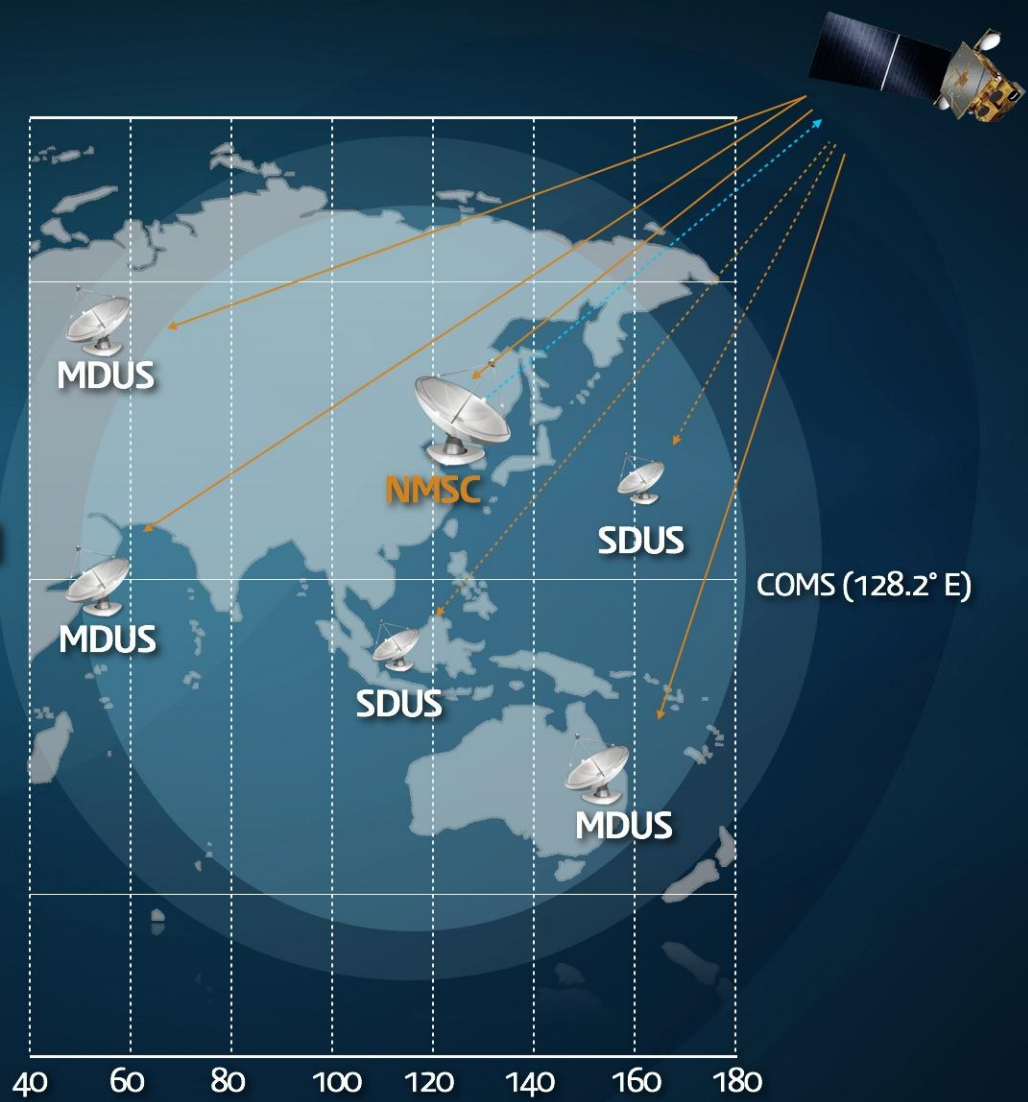
- Station keeping : 2 times/week (N-S(TUE), E-W(THR))
- House keeping : 2 times/day (00:45, 06:45 15:21 UTC)
- Albedo monitoring : 1 time/day (Around 21:35 UTC)
- Dark image observation : 1 time/3 months
- Moon observation : 1 time/month



COMS Data Service (via COMS)

Asia-Pacific Region
covering 30 nations with
2.2 Billion People





COMS Data Service (via ground network)

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



Strengthening the Expert Group Support

- Hierarchical Satellite Data Service (Homepage, ftp)
Level 1B, HRIT/LRIT format data
Cloud and analysis image, COMS products, etc
- Improvement of Satellite Data Service Capability
Enable to select for various period, region, type and format
- Enhancement of easy utilization of data
Provision of data conversion program
Provision of data quality information, algorithm technical document, data user's guide, etc
Satellite data processing/analysis software development and support

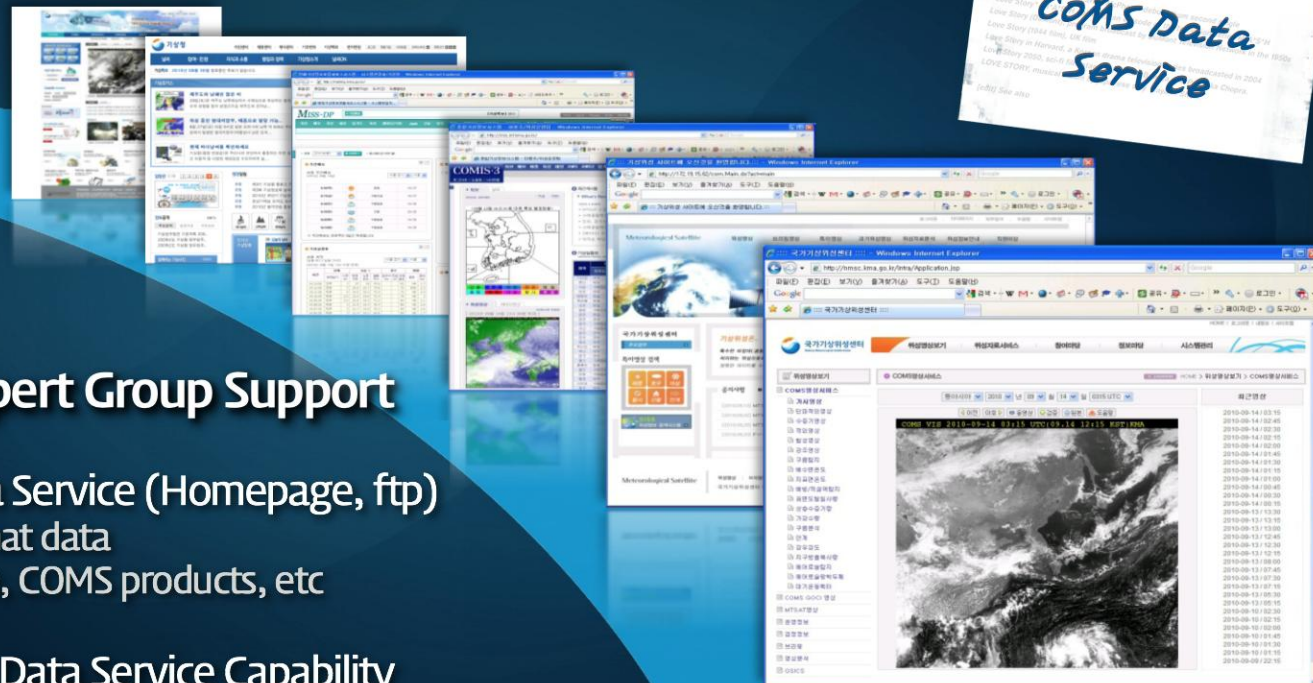
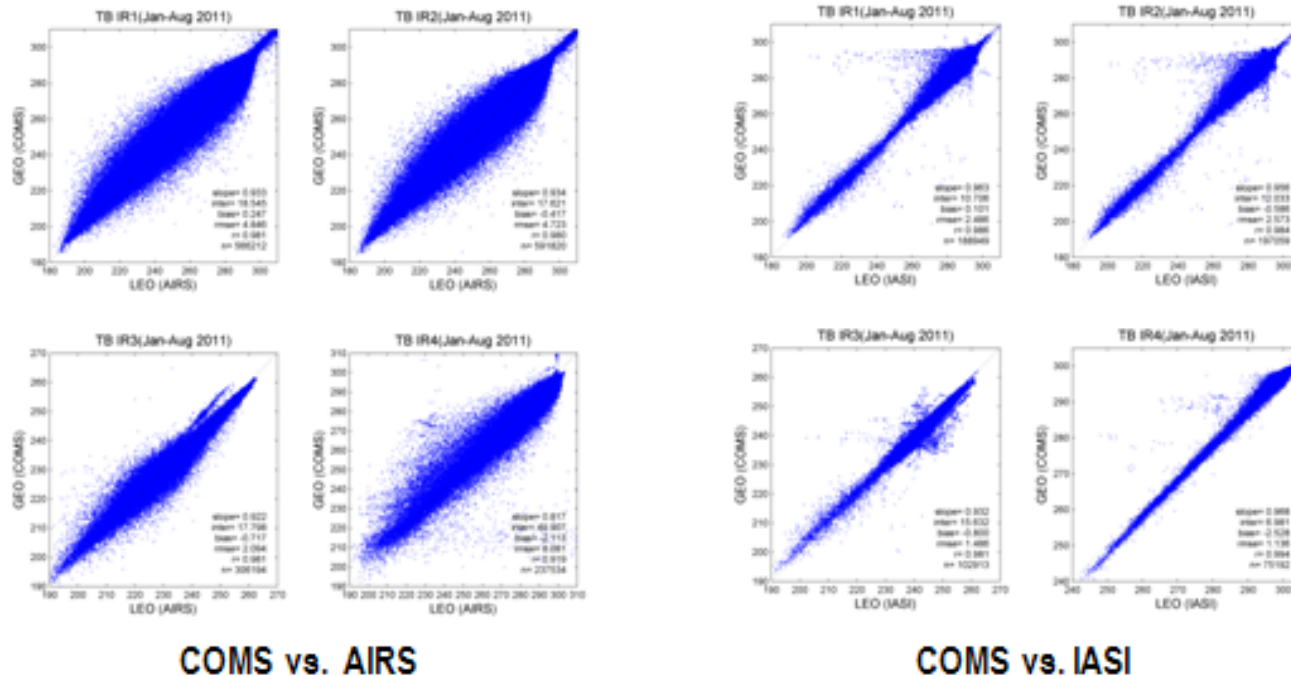


Image Quality Monitoring



Image Quality Monitoring with GSICS Framework

■ TB_{GEO} vs. TB_{LEO} with constraint method



COMS vs. AIRS

COMS vs. IASI

IR1(10.8 μ m) channel is the only one channel having positive bias for both AIRS and IASI. But, the bias of IRI(10.8 μ m) with AIRS and IASI is less than any others from COMS channel. On the contrary to this, inter-calibration data from between IR4(3.7 μ m) and AIRS(IASI) have the largest bias among the channels.

Monitoring of Geometric Performance

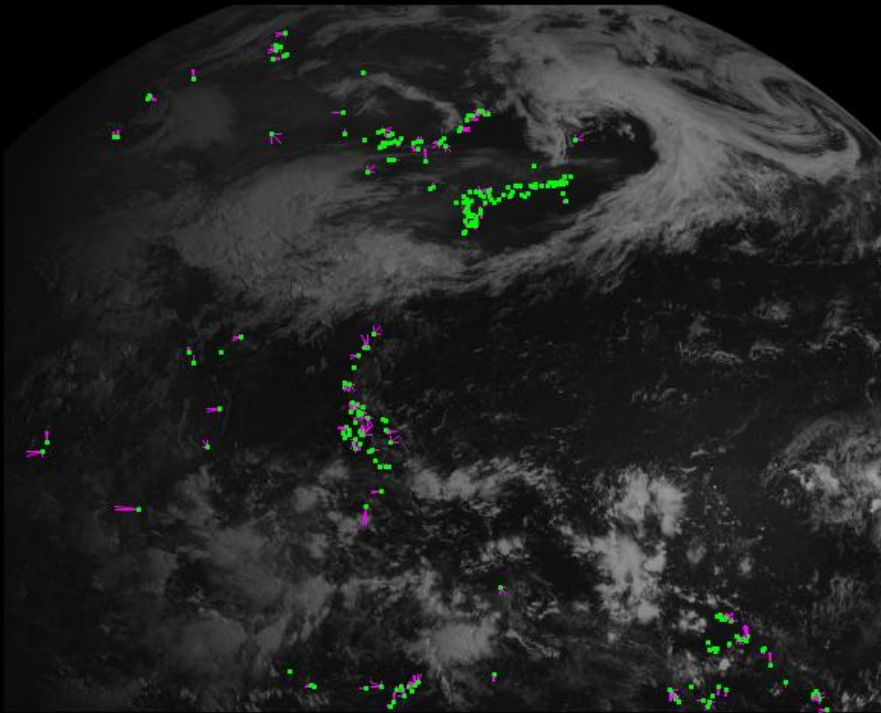
Channel	VIS		IR	
Category	E-W (μrad) (Perf / Spec)	N-S (μrad) (Perf / Spec)	E-W(μrad) (Perf / Spec)	N-S (μrad) (Perf / Spec)
Navigation	39.8 / 65.3	33.4 / 65.3	47.0 / 87.5	42.4 / 87.5
Within Frame Registration	45.5 / 63.4	45.9 / 63.4	55.4 / 103.9	56.3 / 103.9
15min F-F Registration	20.0 / 55.2	17.0 / 55.2	27.0 / 99.1	24.5 / 99.1
90min F-F Registration	24.3 / 63.4	20.5 / 63.4	31.0 / 103.9	28.4 / 103.9

- Period : April ~ September, 2011(6 months)
- Specification = User requirements + Measurement Accuracy
 - * 28 (μrad) = 1 pixel @ vis = 1 km

=> The Performances of COMS Navigation & Registration are within the specification

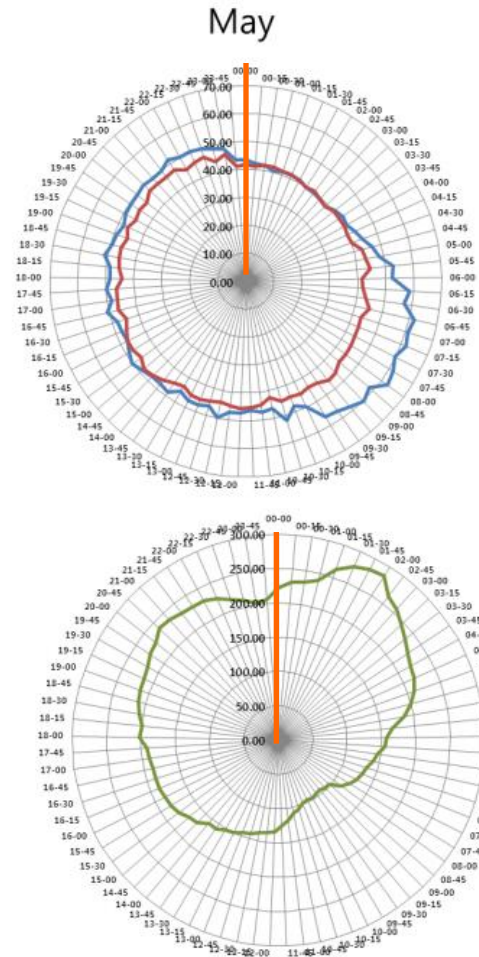
COMS INR Performance

COMS # Landmark Analysis Map (ImageRef: 2011-05-02.00-00-11 [ENH])



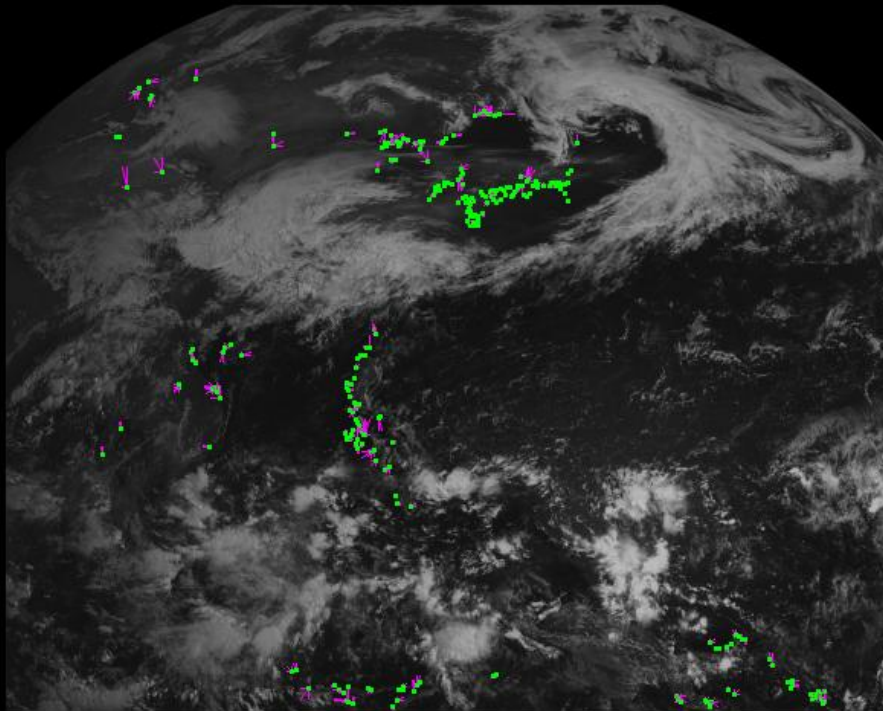
Total	VIS	IR
228	134	94

2011-05-02.00-00-11



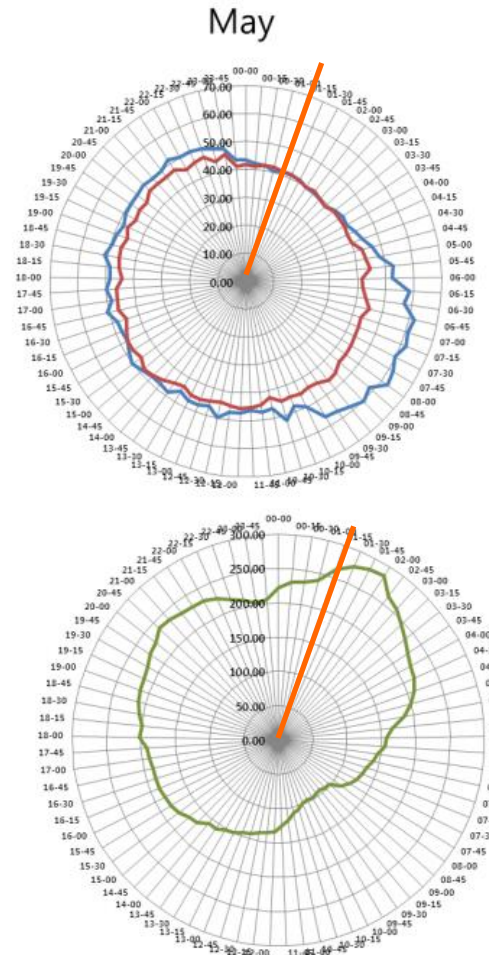
COMS INR Performance

COMS # Landmark Analysis Map (ImageRef: 2011-05-02.01-00-10 [ENH])



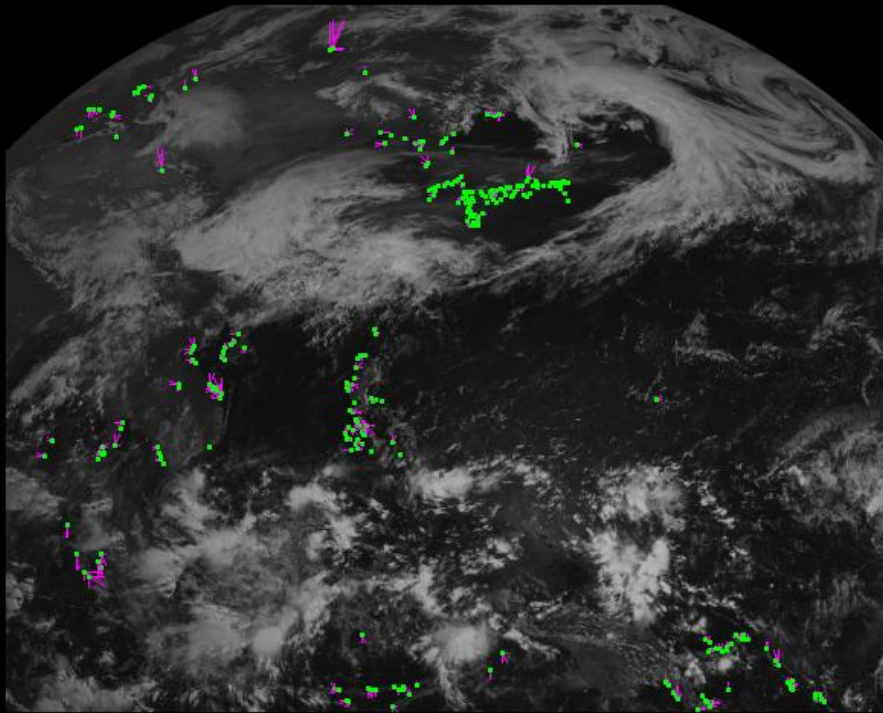
Total	VIS	IR
256	177	79

2011-05-02.01-00-10



COMS INR Performance

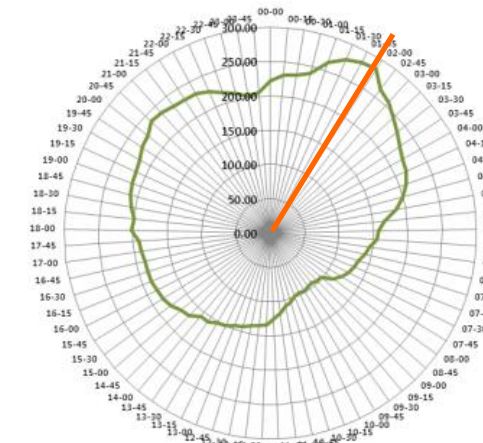
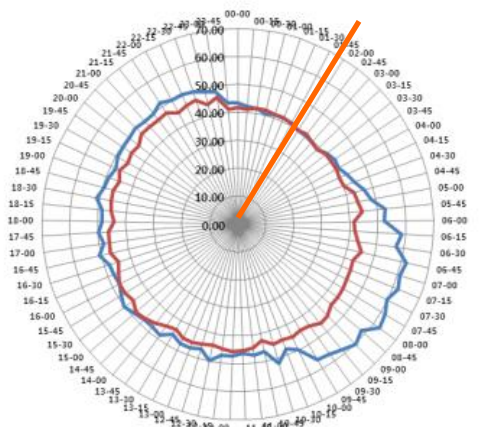
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.02-00-10 [ENH])



Total	VIS	IR
274	225	49

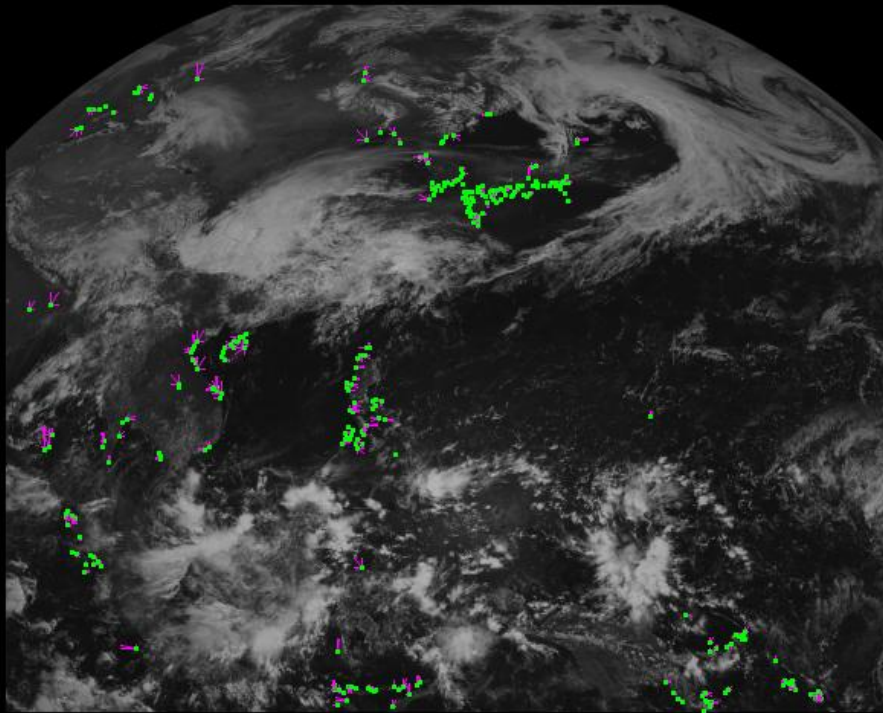
2011-05-02.02-00-10

May



COMS INR Performance

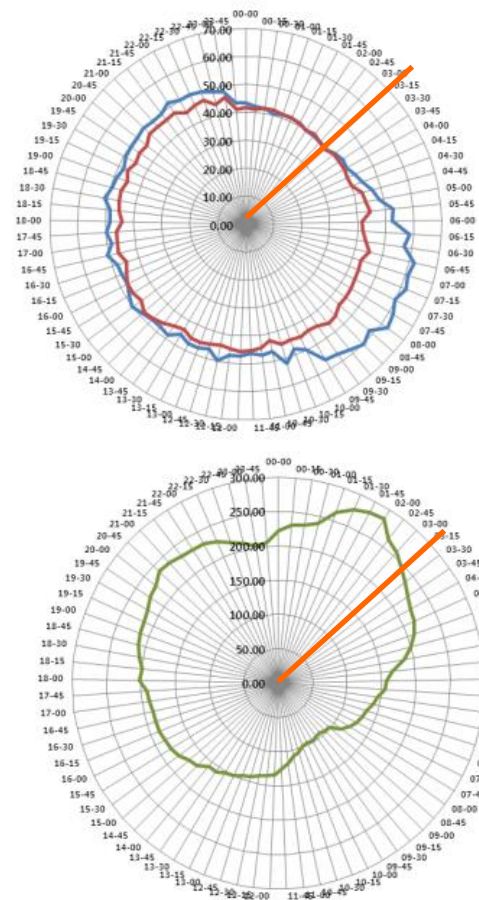
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.03-00-11 [ENH])



Total	VIS	IR
285	250	35

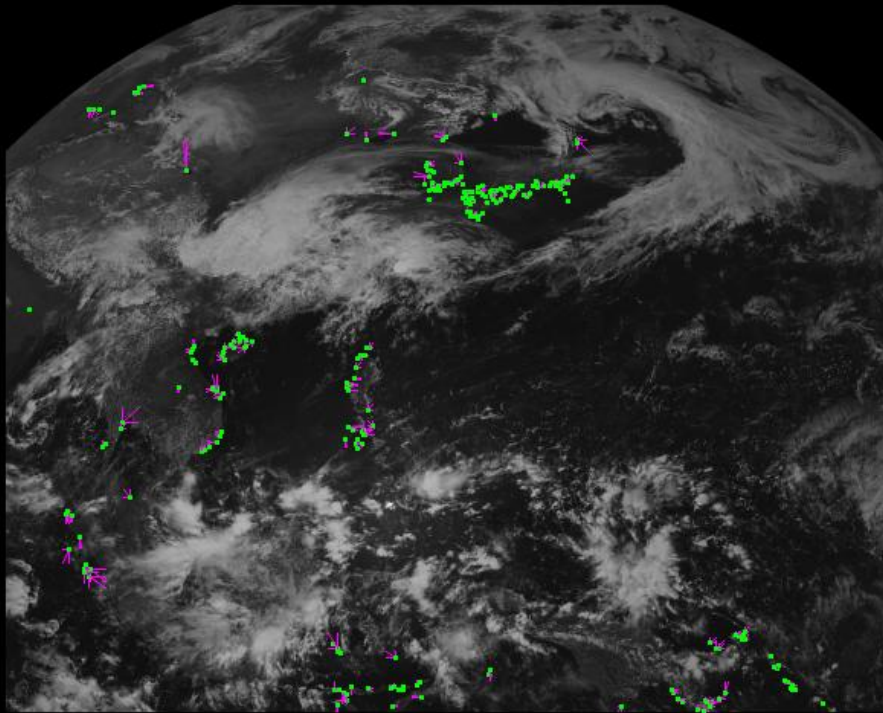
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May



COMS INR Performance

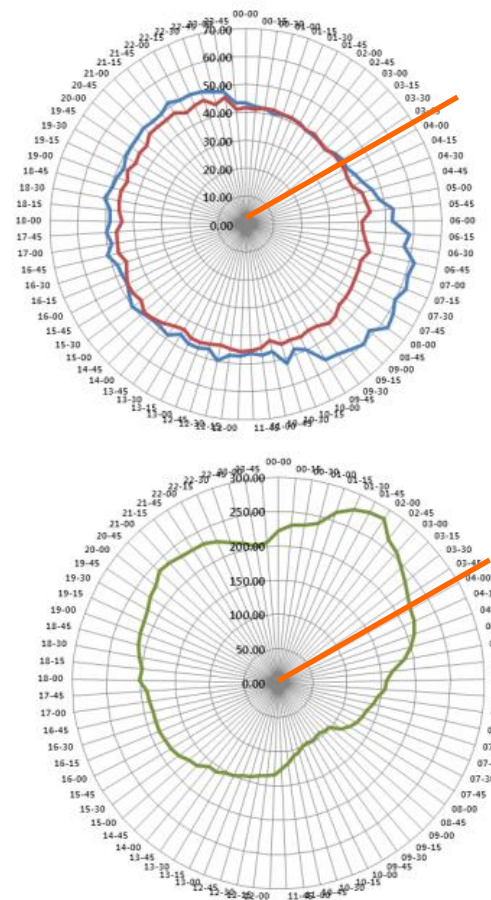
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.04-00-12 [ENH])



Total	VIS	IR
241	211	30

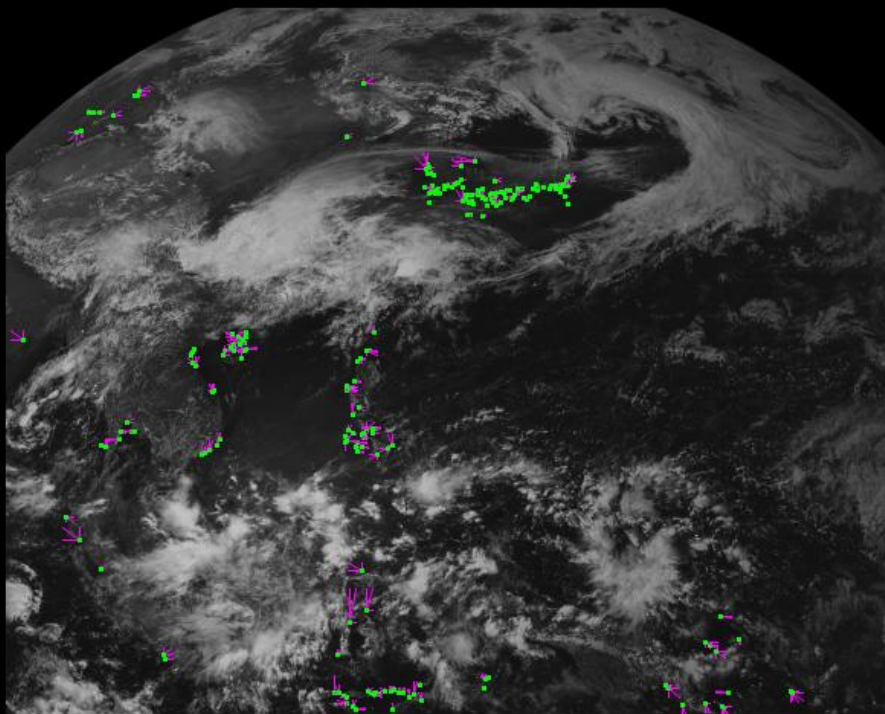
2011-05-02.04-00-12

May



COMS INR Performance

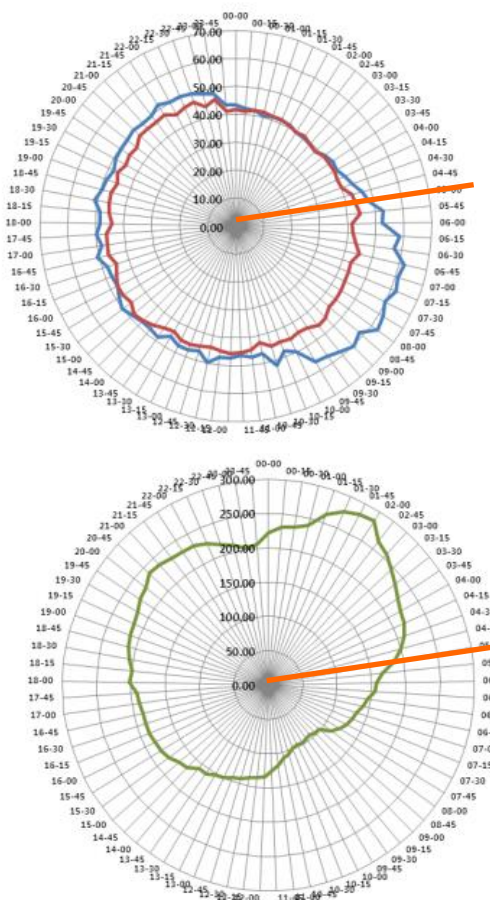
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.05-00-11 [ENH])



Total	VIS	IR
213	159	54

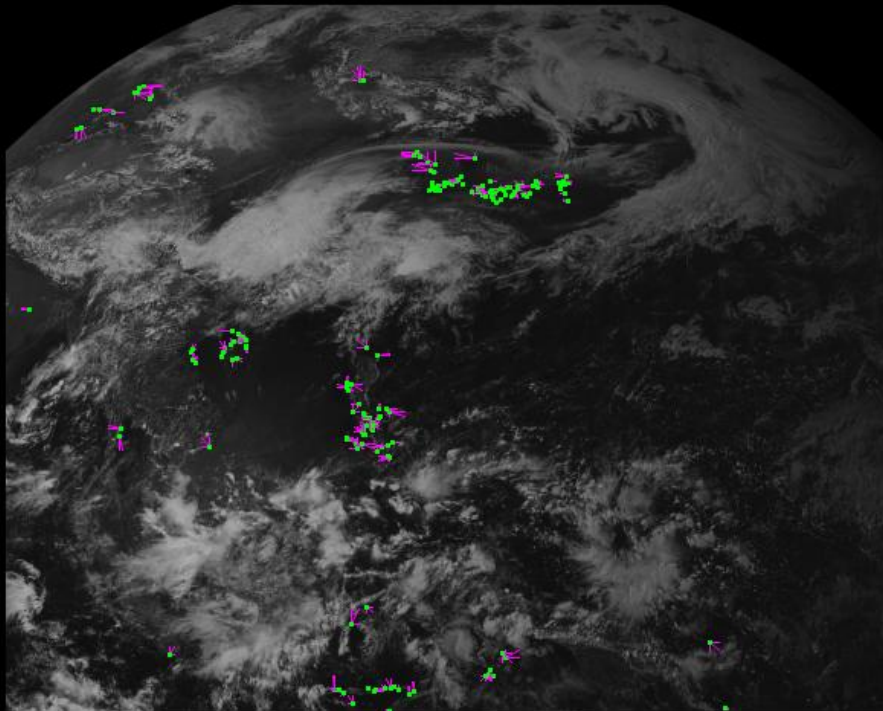
2011-05-02.05-00-11

May



COMS INR Performance

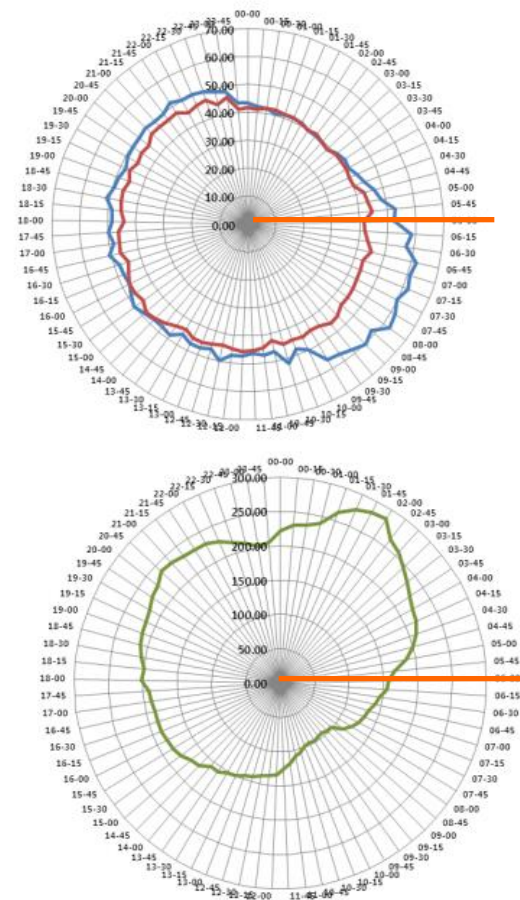
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.06-00-11 [ENH])



Total	VIS	IR
166	102	64

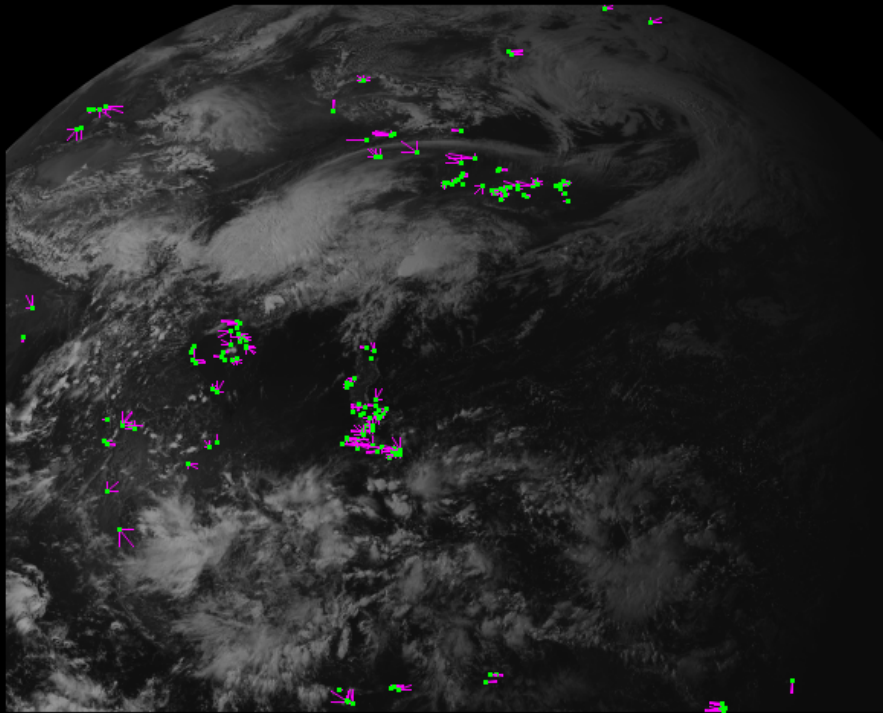
2011-05-02.06-00-11

May



COMS INR Performance

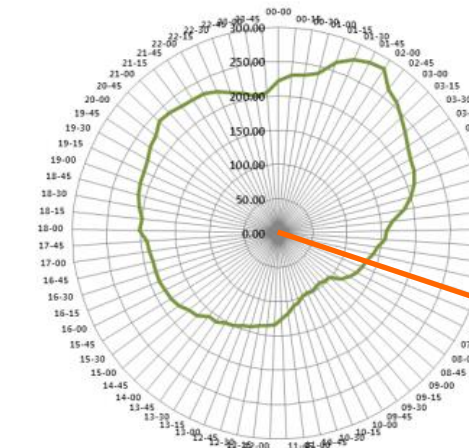
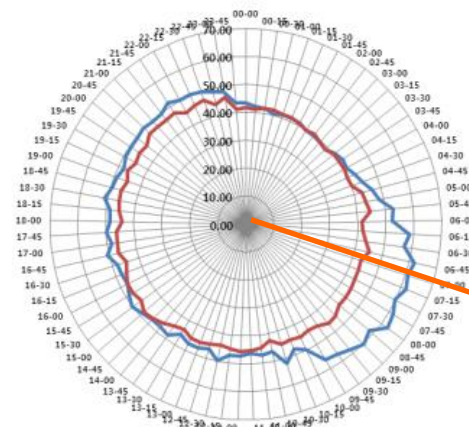
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.07-00-11 [ENH])



Total	VIS	IR
157	63	94

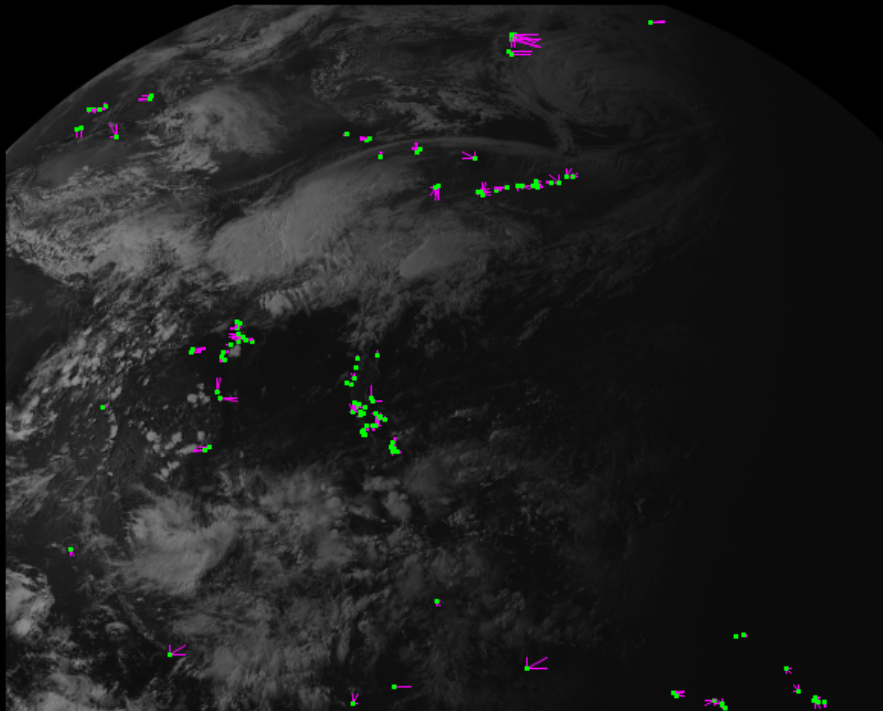
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May



COMS INR Performance

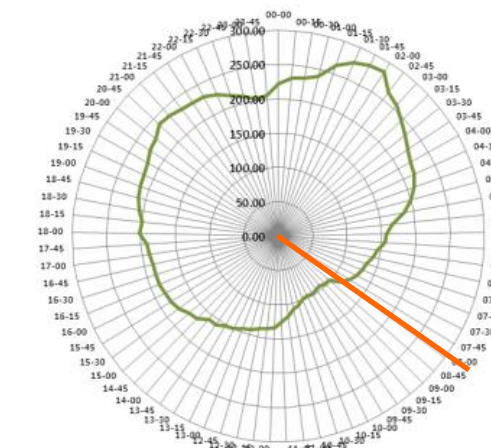
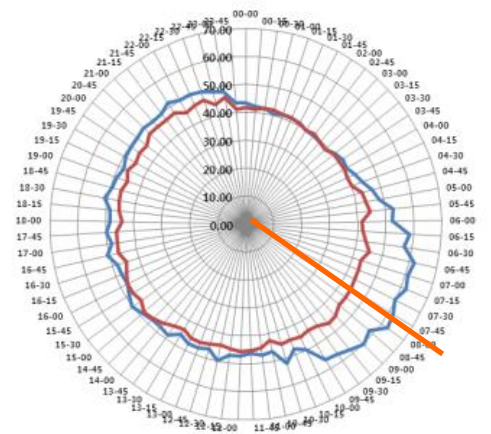
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.08-00-15 [ENH])



Total	VIS	IR
113	10	103

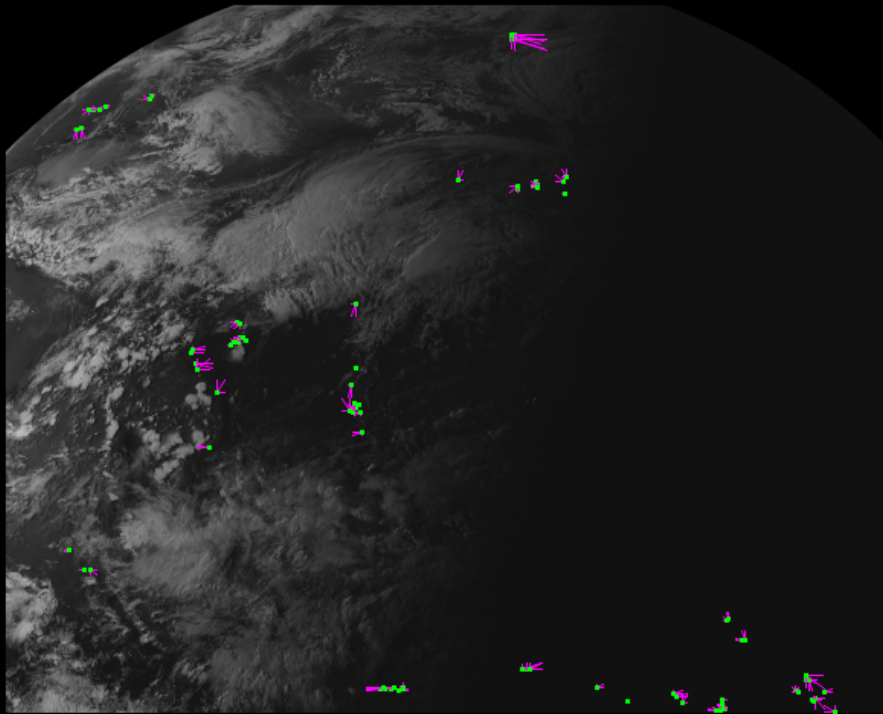
2011-05-02.08-00-15

May



COMS INR Performance

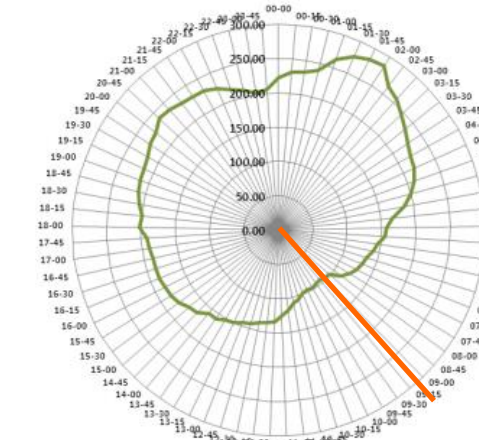
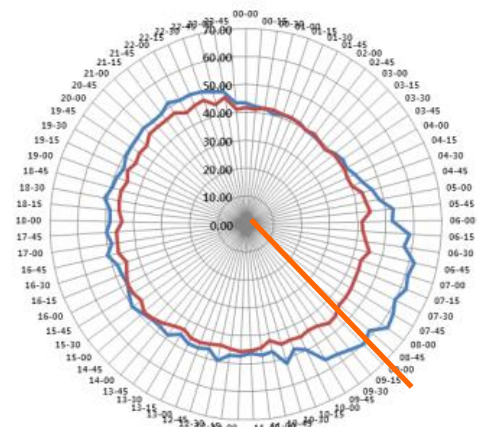
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.09-00-12 [ENH])



Total	VIS	IR
86	4	82

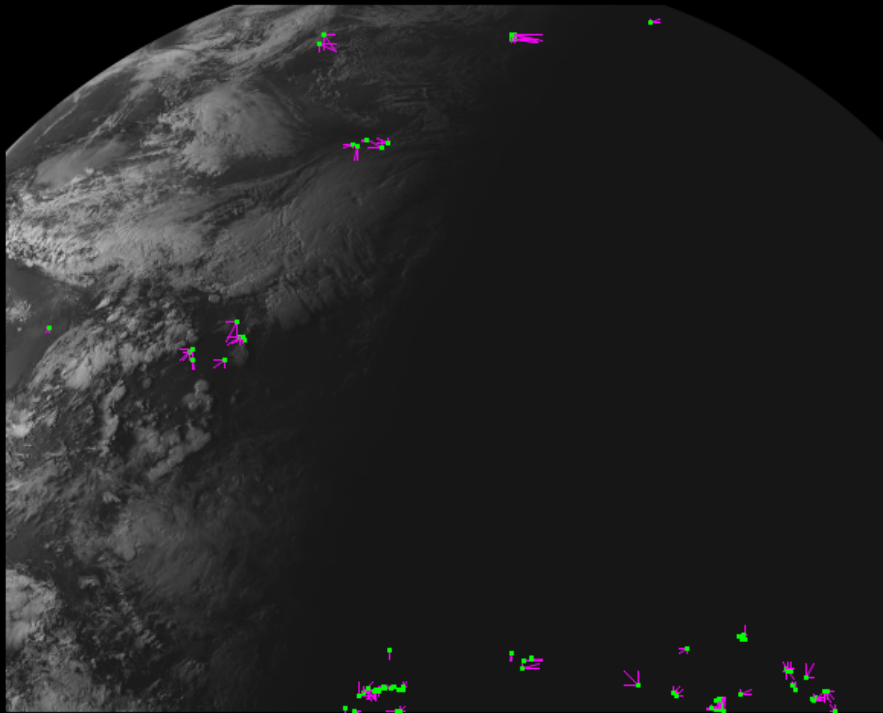
2011-05-02.09-00-12

May



COMS INR Performance

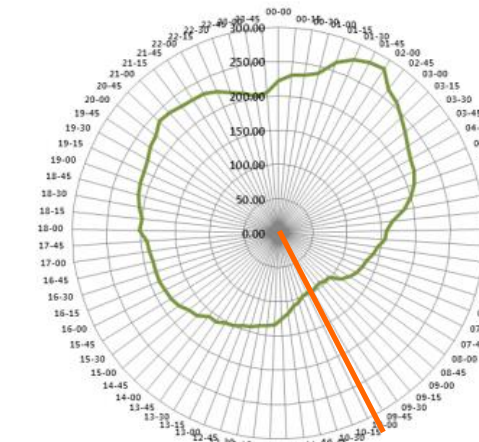
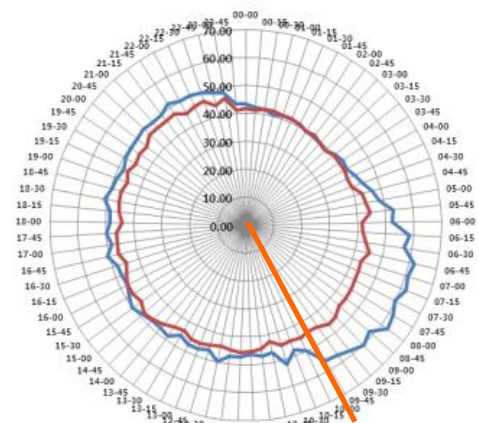
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.10-00-11 [ENH])



Total	VIS	IR
75	6	69

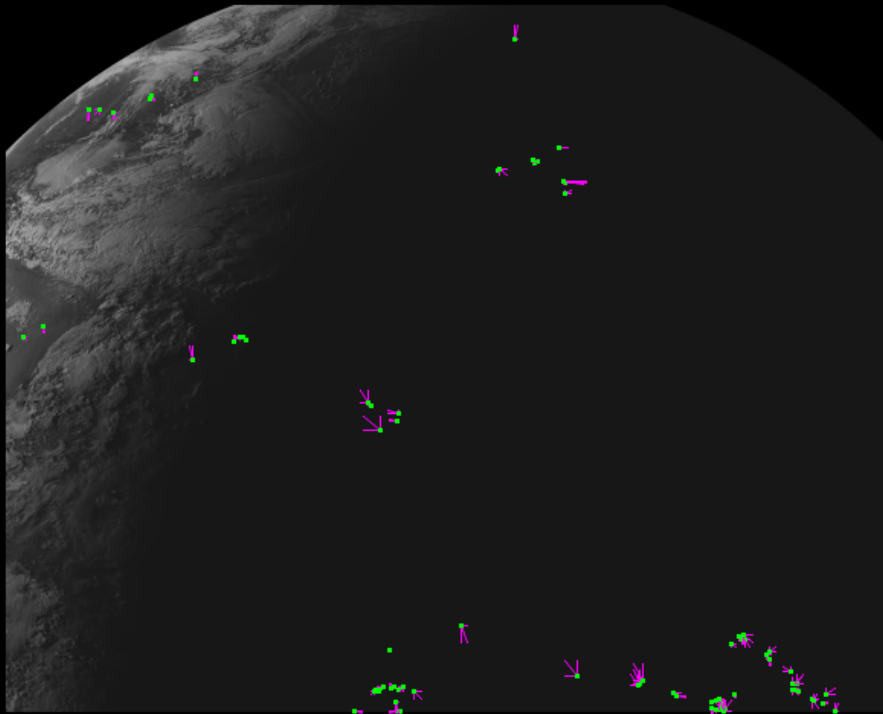
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May



COMS INR Performance

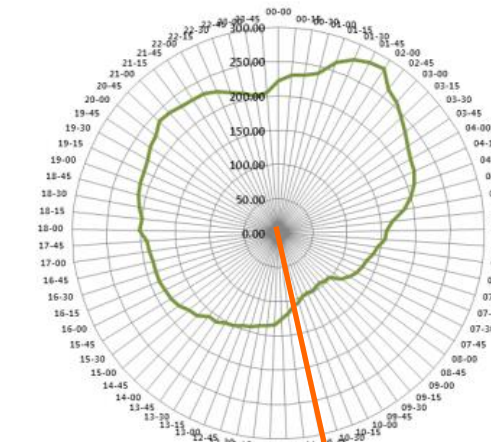
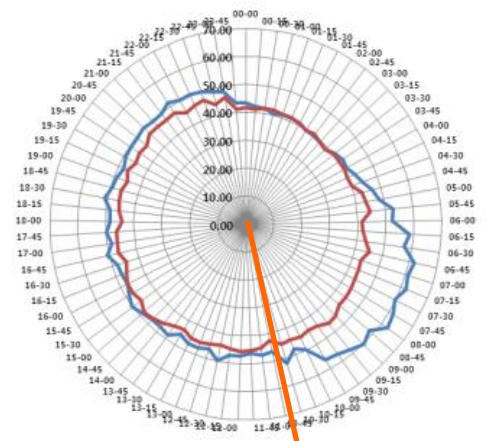
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.11-00-11 [ENH])



Total	VIS	IR
80	0	80

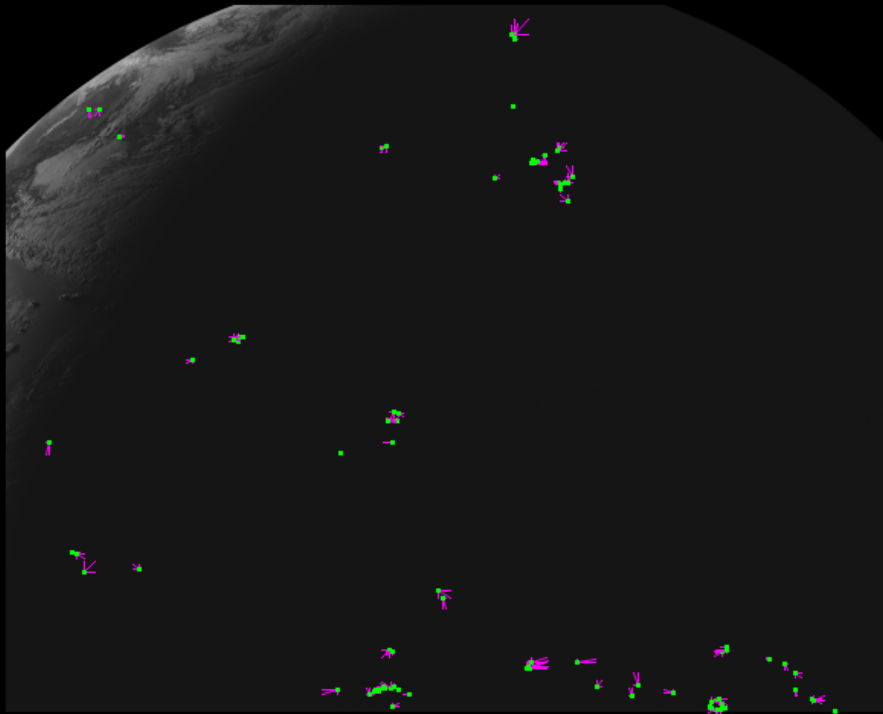
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May



COMS INR Performance

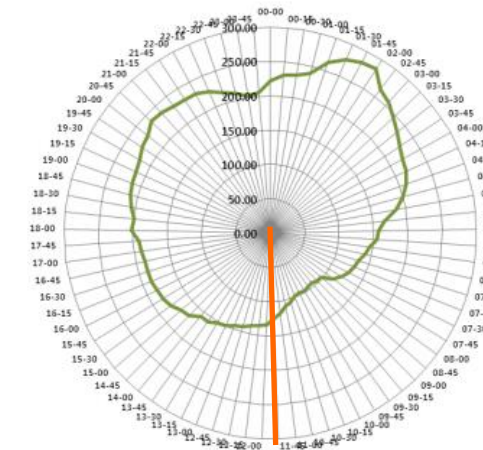
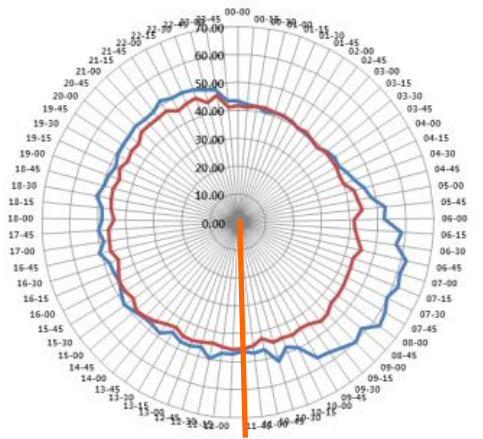
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.12-00-11 [ENH])



Total	VIS	IR
86	0	86

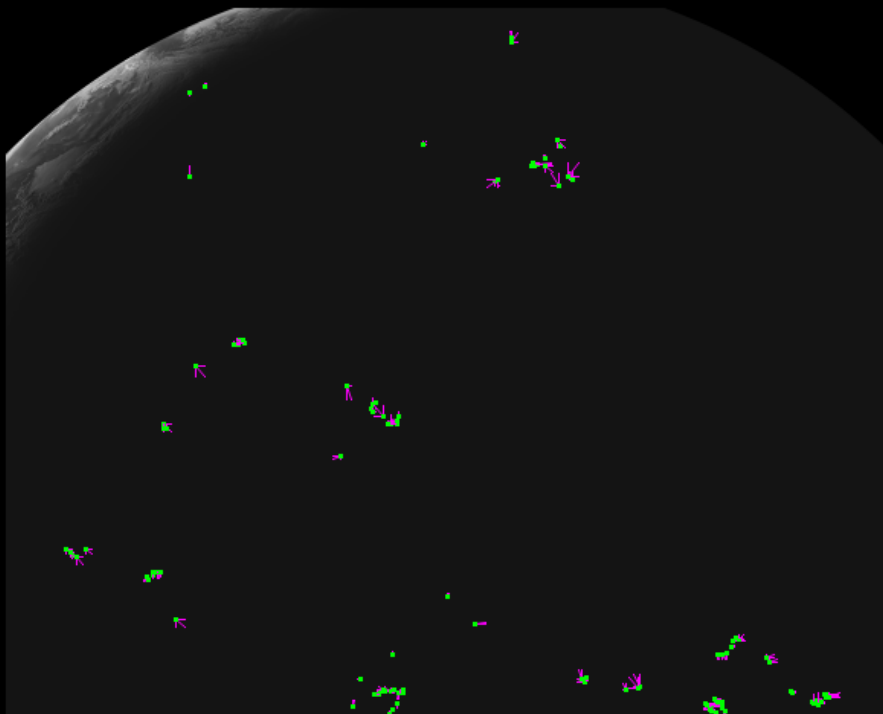
2011-05-02.12-00-11

May



COMS INR Performance

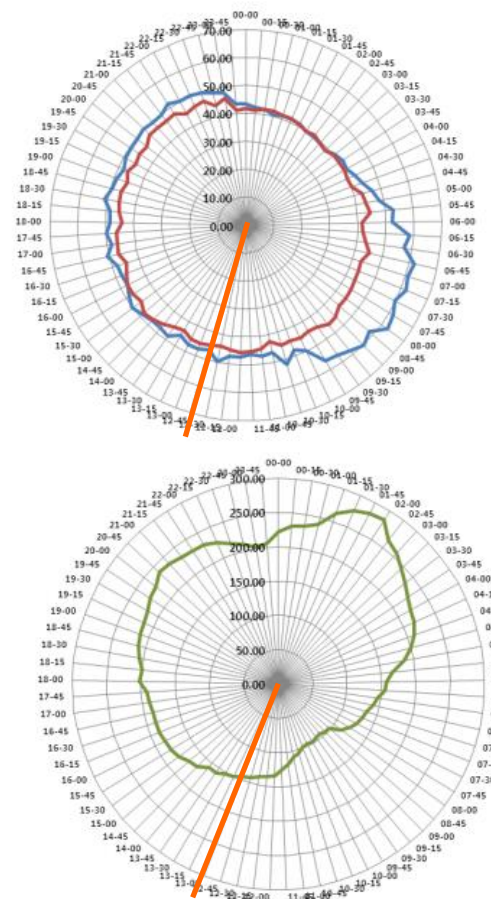
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.13-00-13 [ENH])



Total	VIS	IR
109	0	109

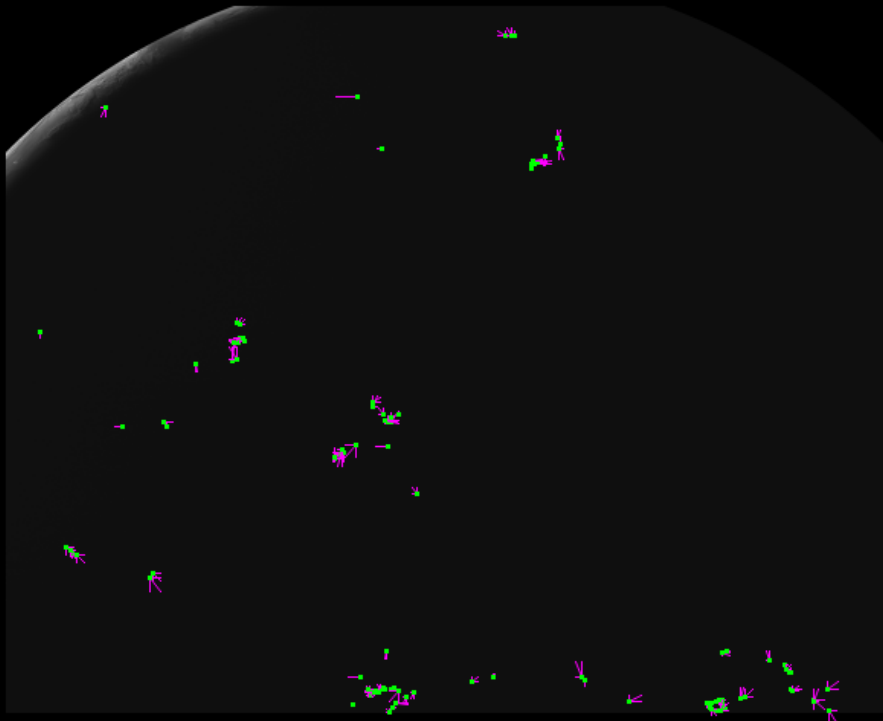
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May



COMS INR Performance

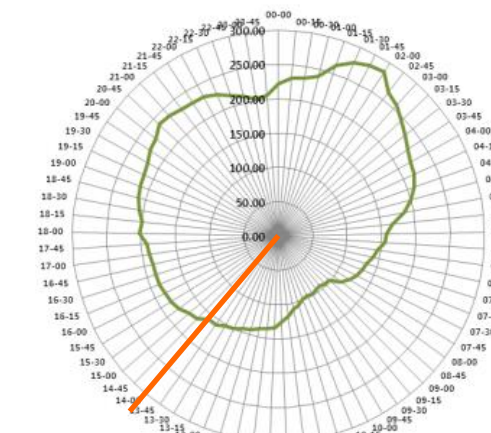
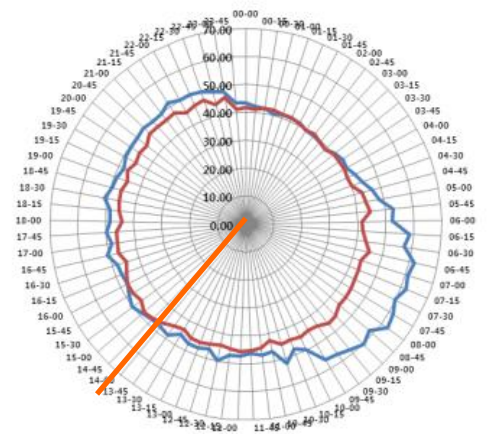
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.14-00-12 [ENH])



Total	VIS	IR
103	0	103

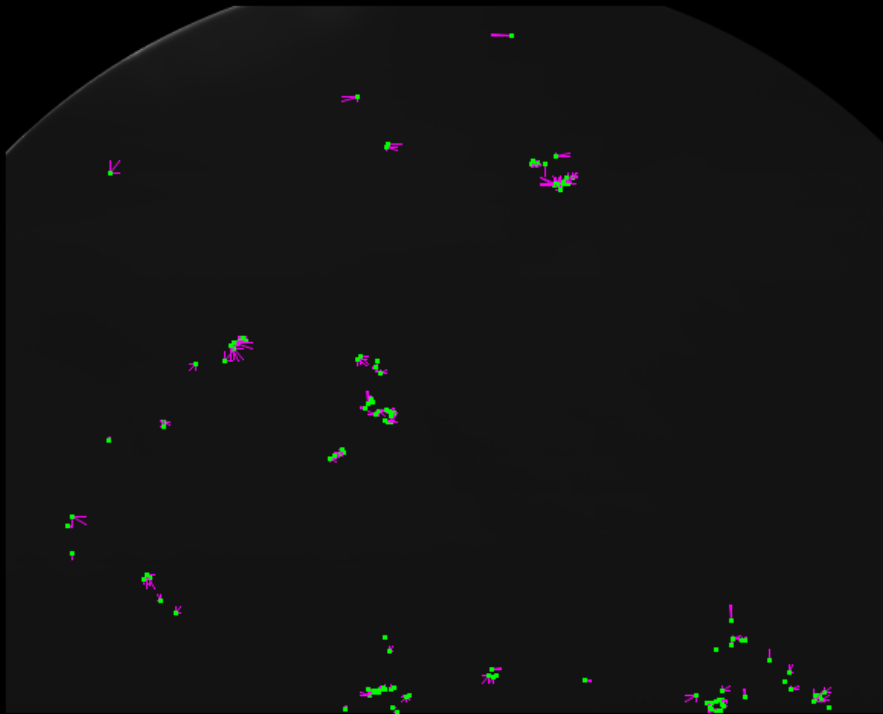
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May



COMS INR Performance

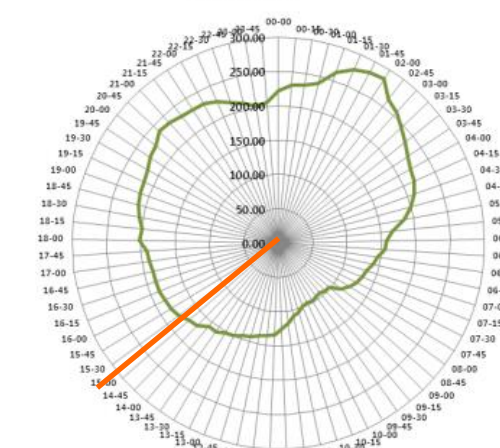
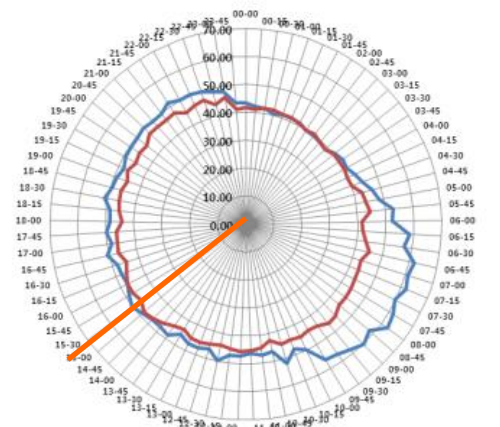
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.15-00-11 [ENH])



Total	VIS	IR
118	0	118

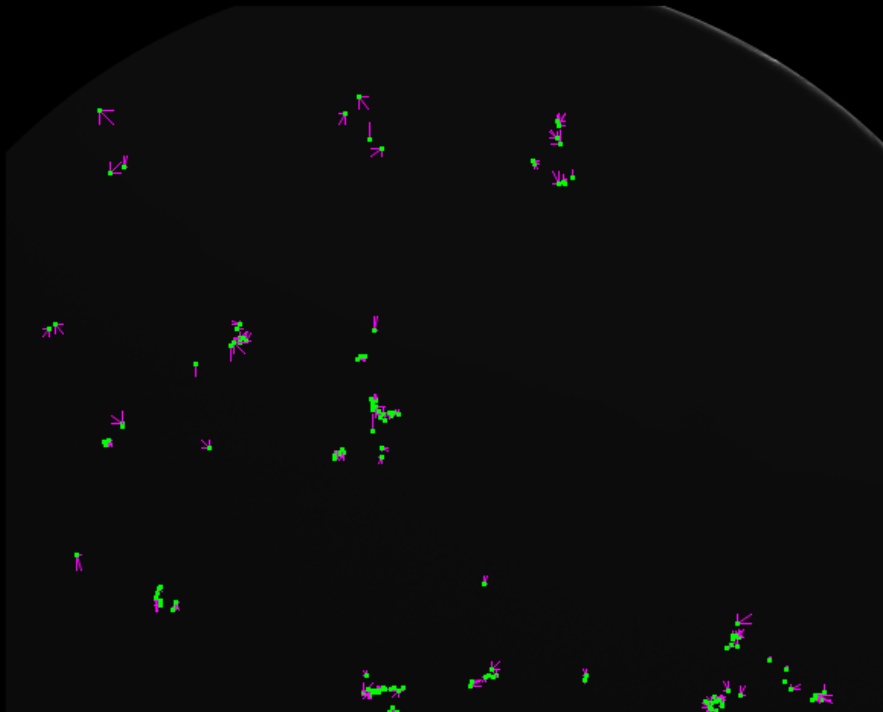
2011-05-02.15-00-11

May



COMS INR Performance

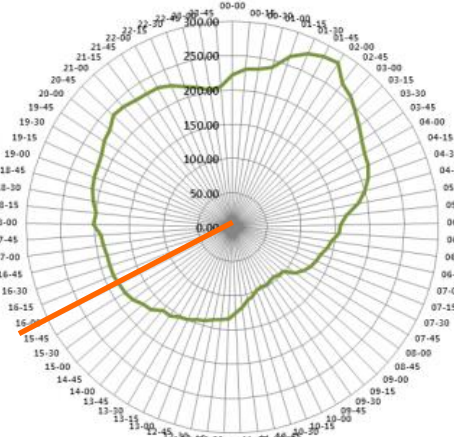
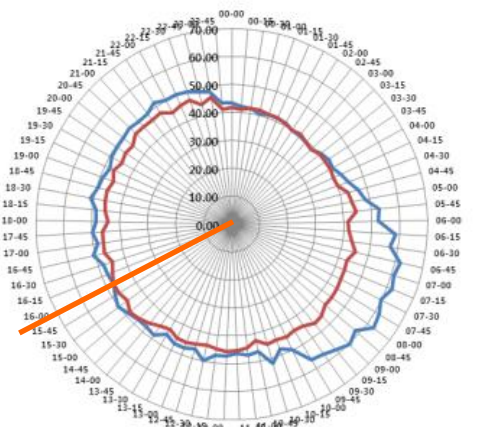
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.16-00-09 [ENH])



Total	VIS	IR
131	0	131

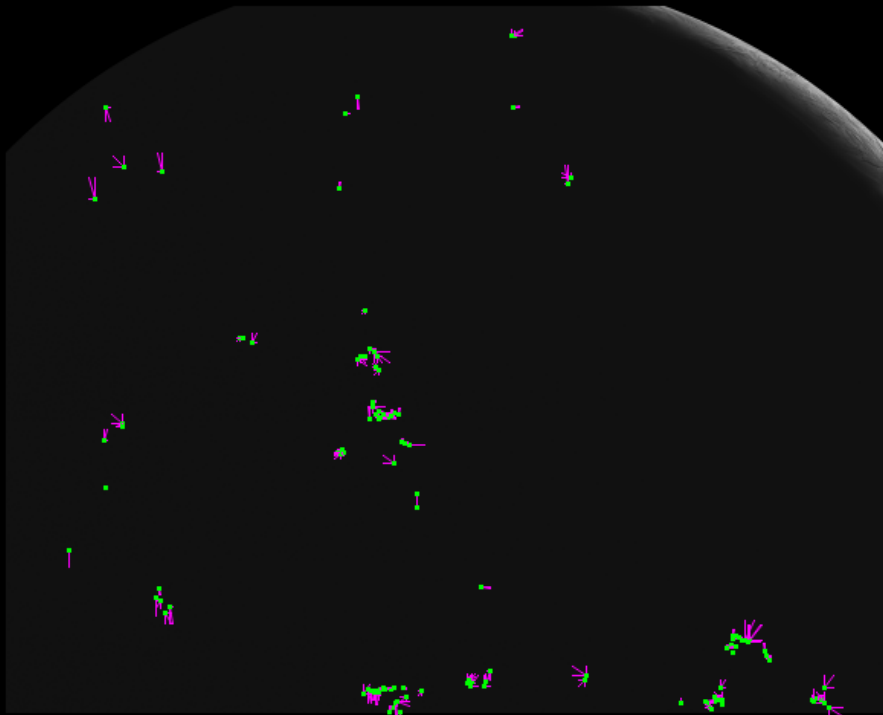
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May



COMS INR Performance

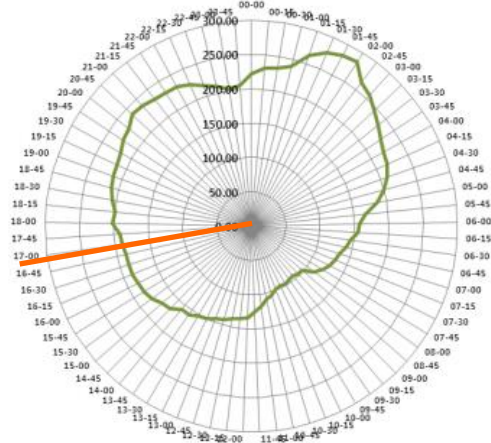
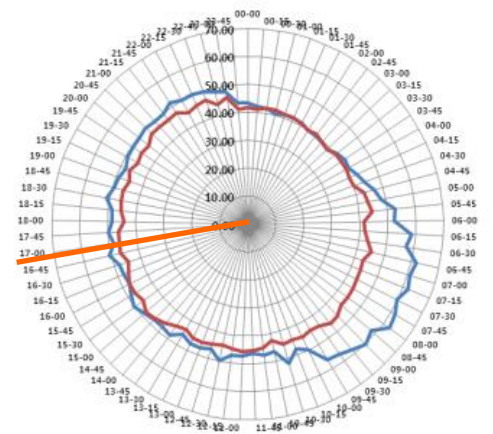
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.17-00-09 [ENH])



Total	VIS	IR
118	0	118

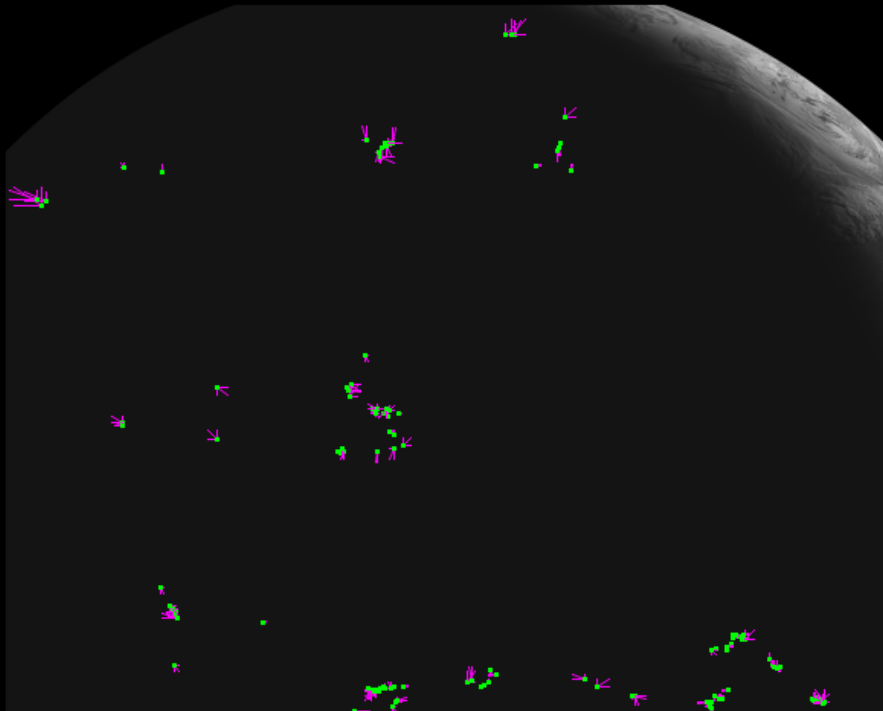
2011-05-02.17-00-09

May



COMS INR Performance

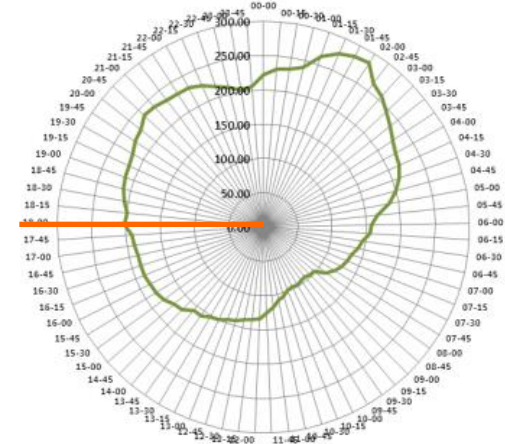
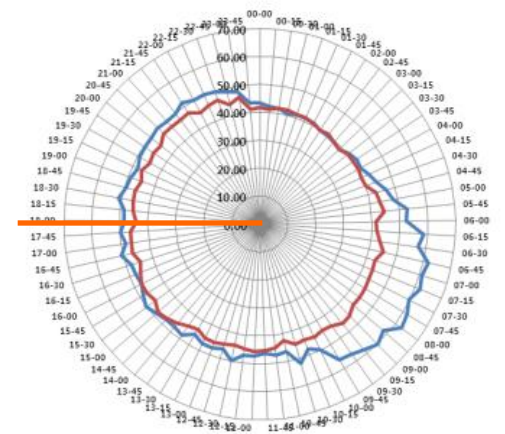
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.18-00-10 [ENH])



Total	VIS	IR
114	0	114

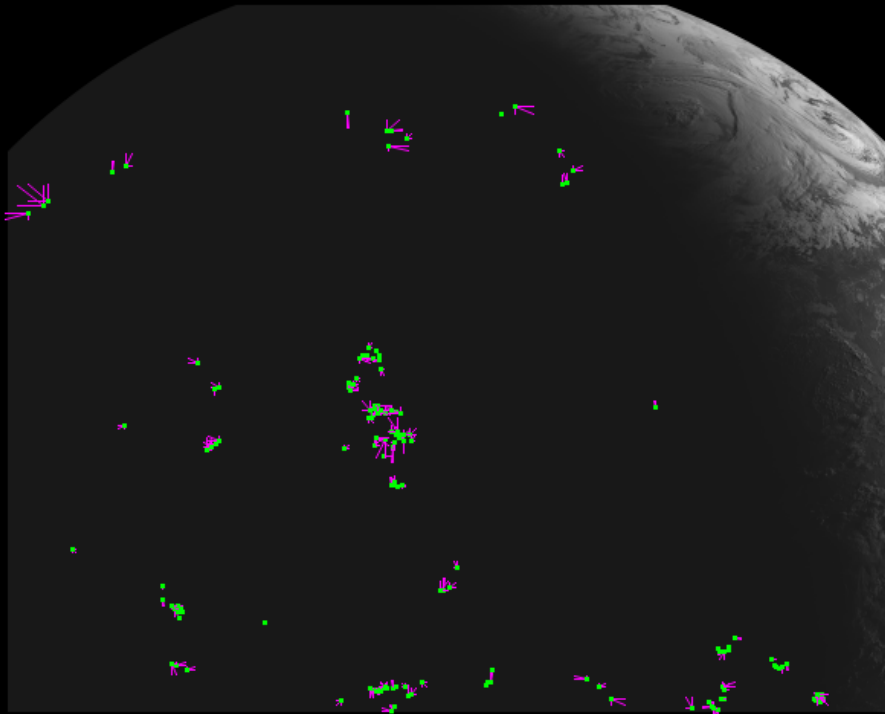
2011-05-02.18-00-10

May



COMS INR Performance

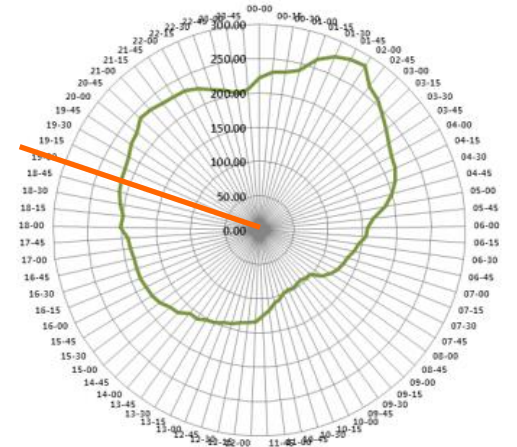
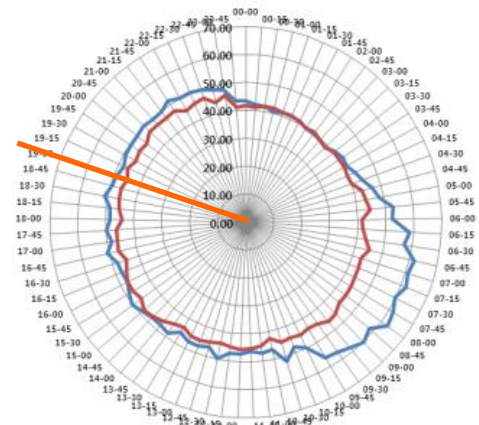
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.19-00-11 [ENH])



Total	VIS	IR
143	0	143

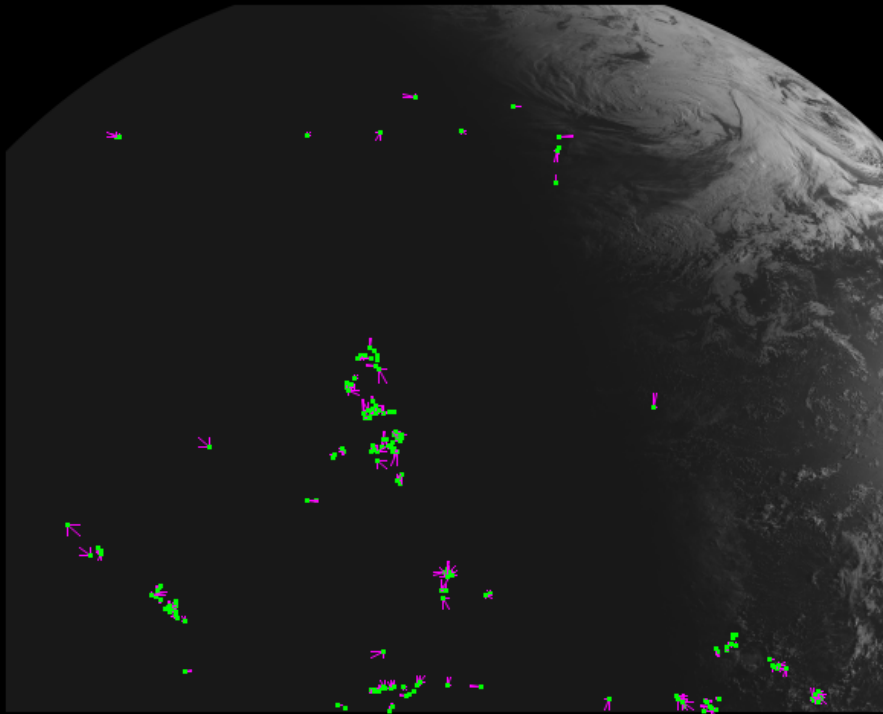
2011-05-02.19-00-11

May



COMS INR Performance

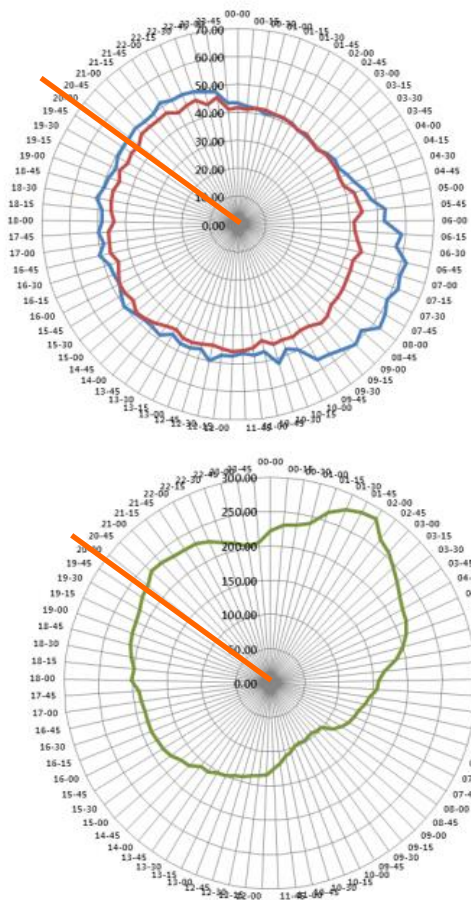
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.20-00-09 [ENH])



Total	VIS	IR
163	0	163

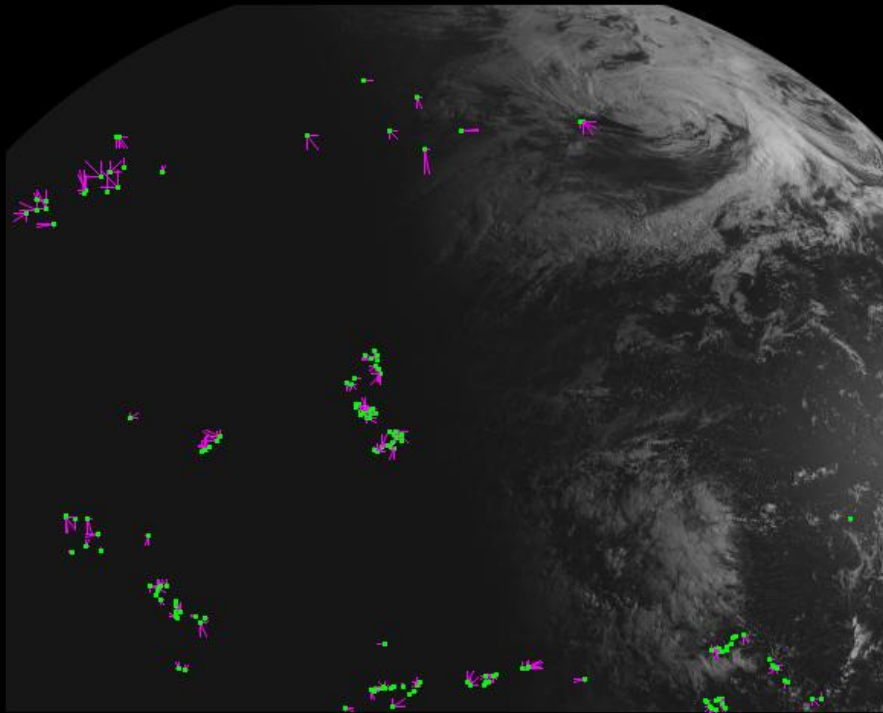
2011-05-02.20-00-09

May



COMS INR Performance

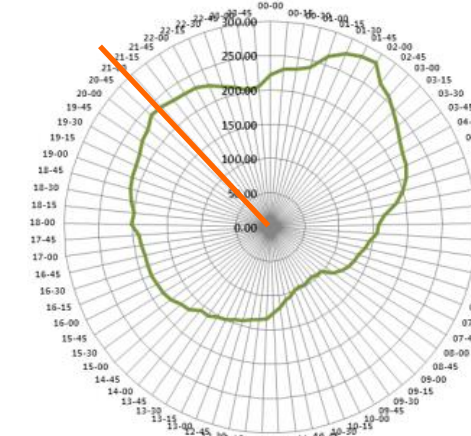
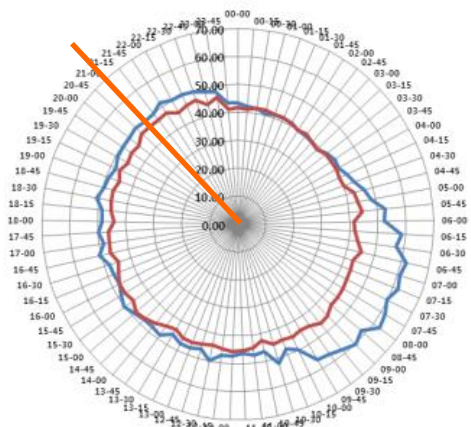
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.21-00-09 [ENH])



Total	VIS	IR
155	0	155

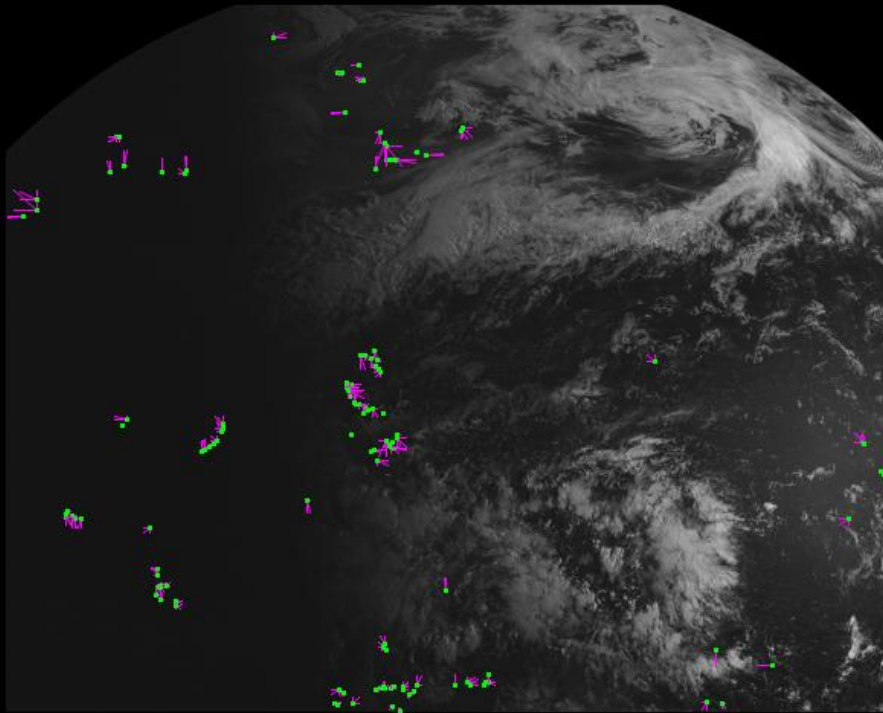
2011-05-02.21-00-09

May



COMS INR Performance

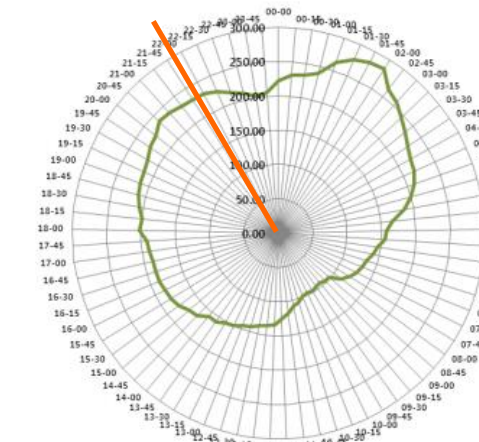
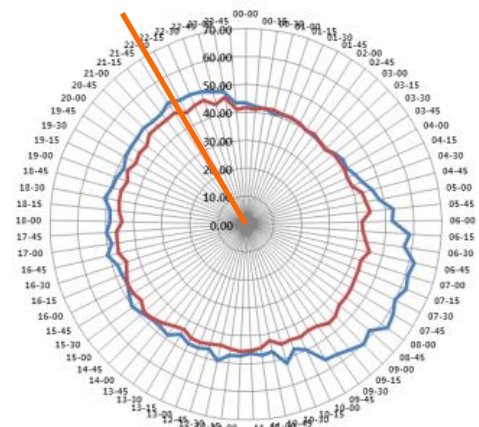
COMS # Landmark Analysis Map (ImageRef: 2011-05-02.22-00-09 [ENH])



Total	VIS	IR
129	19	109

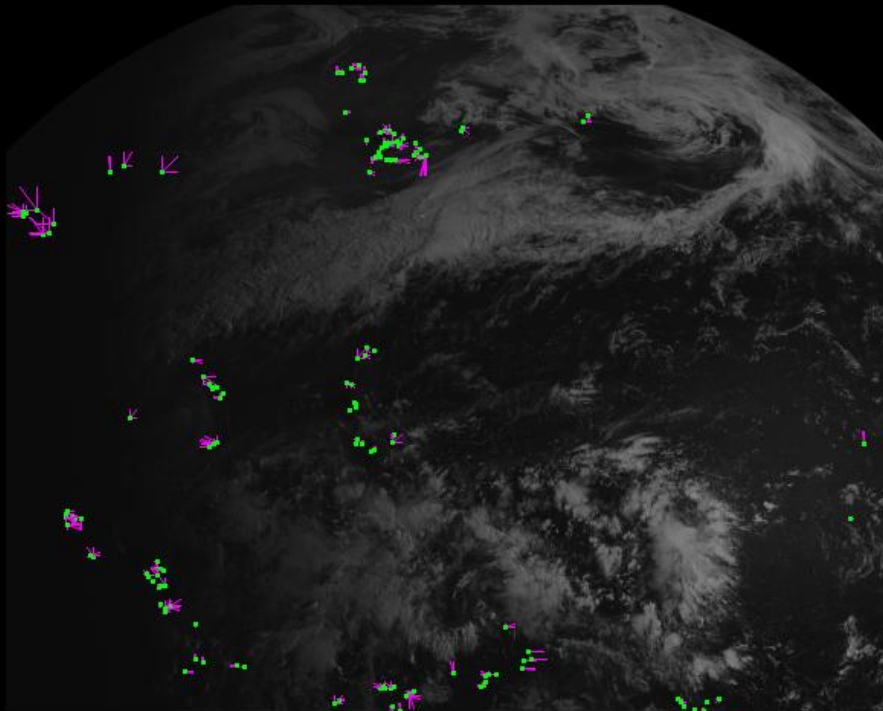
2011-05-02.22-00-09

May



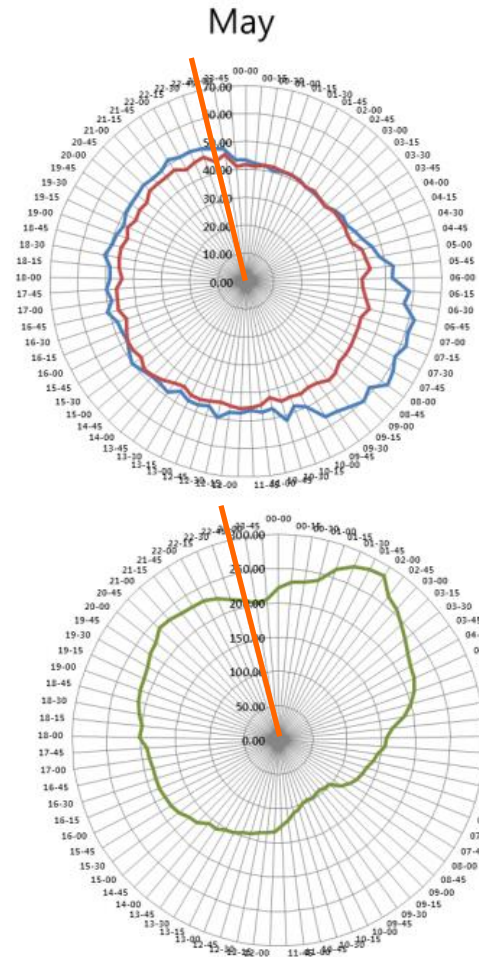
COMS INR Performance

COMS # Landmark Analysis Map (ImageRef: 2011-05-02.23-00-09 [ENH])



Total	VIS	IR
144	58	86

2011-05-02.23-00-09



Future Plan



Thank you very much for your attention!

