



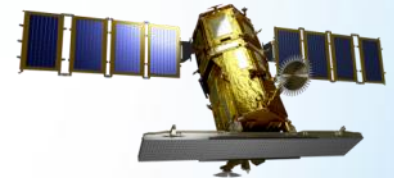
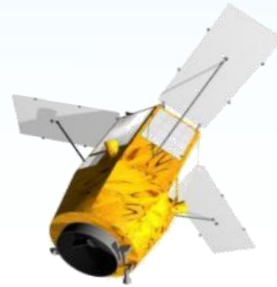
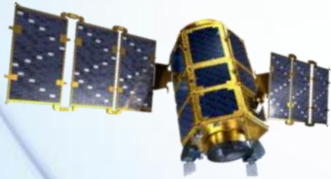
**GISTDA**

*Fair Access to Space*

# **KOMPSAT Workshop**

**- Discover the Earth at Sub-meter Resolution -**

## **V. Image Data Overview**



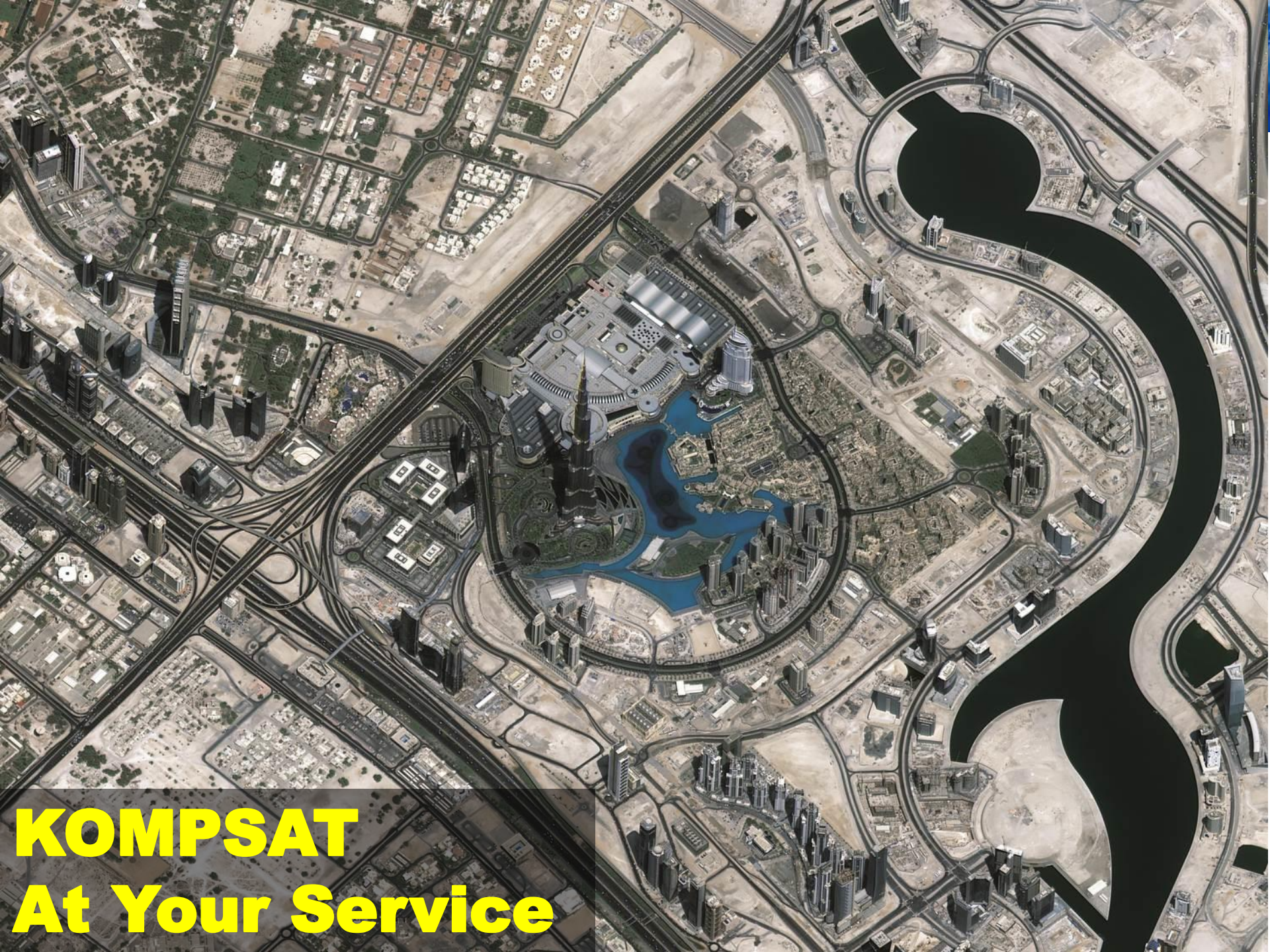
**March, 2015**

**SI Imaging Services**

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**KOMPSAT**  
**At Your Service**



# Contents

I

Image data level, type, and format

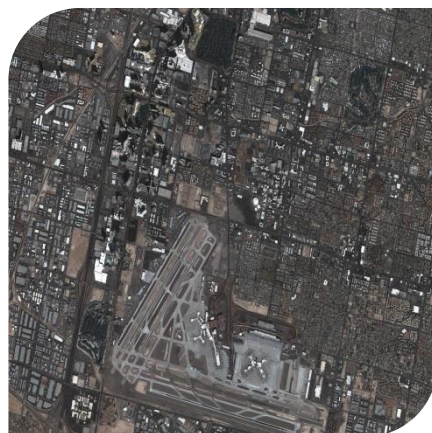
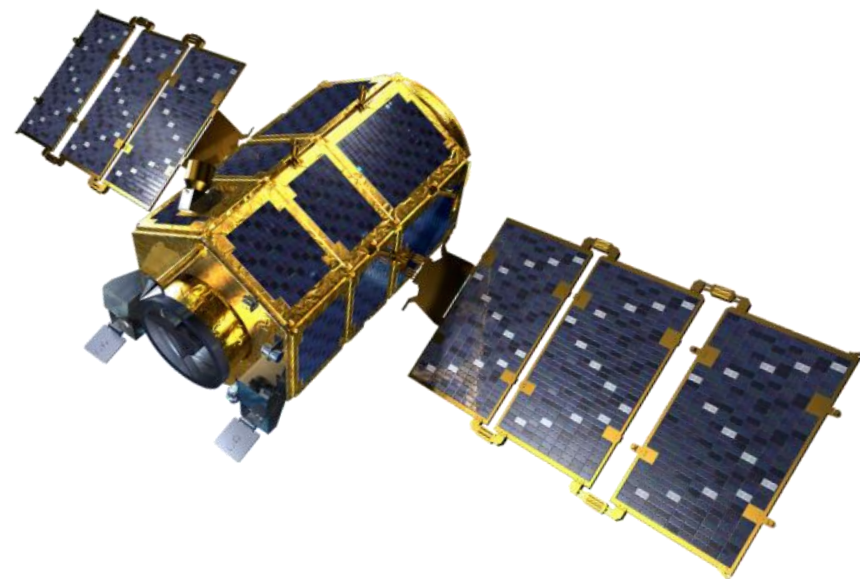
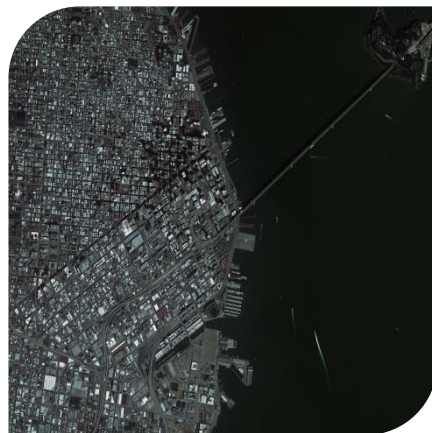
II

Ordering parameters

III

Catalogue system & supportive COTS

# KOMPSAT-2 Image Data



# Product Level

**1R**

- **POD/PAD**
- **Radiometric Correction**
- **Sensor Correction**
- **MTF Compensation**
- **TIFF format**

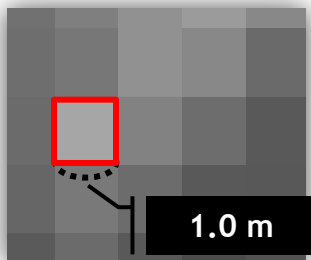
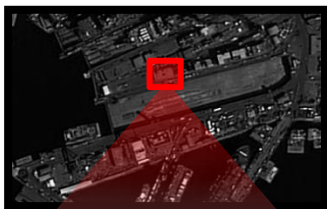
**1G**

- **Radiometric Correction**
- **Sensor Correction**
- **MTF Compensation**
- **Geometrical Correction**
- **GeoTIFF format**

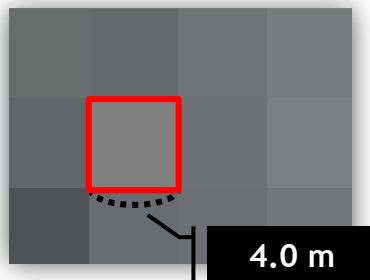
# Product Type & Format (1/2)

## ❖ Bundle

- 1 PAN (1.0 m) + 4 MS (R/G/B/NIR: 4.0 m)

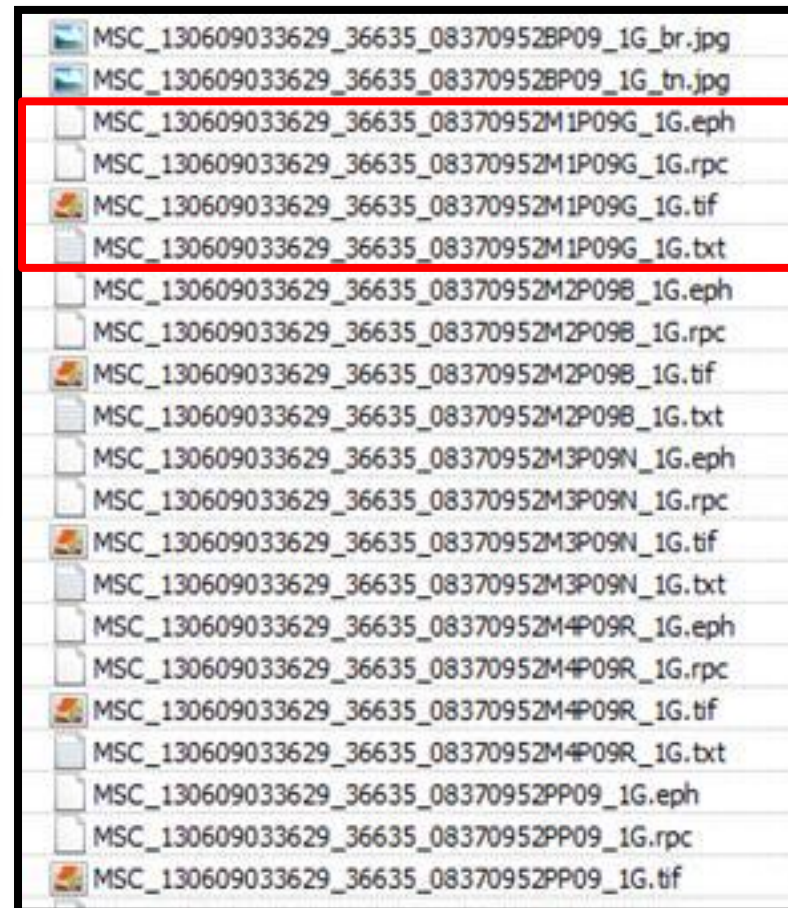


1.0 m



4.0 m

For each Band (PAN, MS1 ~ MS4)	Image File (GeoTiff)
	EPH File (text)
	Auxiliary File (text)
	RPC File(text)
Etc	Browse Image File (Jpeg) Thumbnail File(Jpeg)





# Product Type & Format (2/2)

## ❖ PAN-Sharpended

- 4 MS : 1.0 m (resampled R/G/B/NIR)

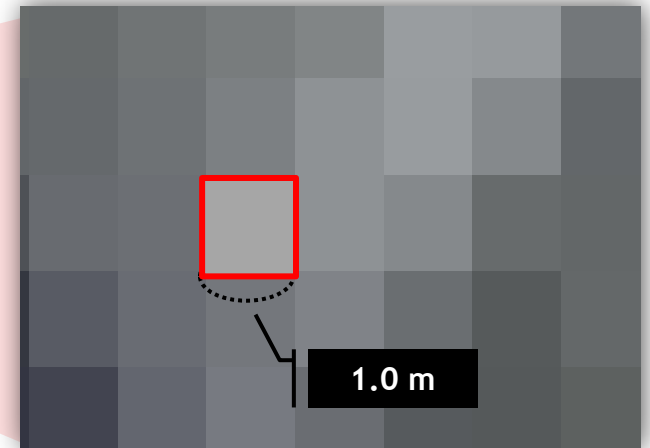


Image File	Image File (GeoTiff) - Includes 4 bands (*) - R/G/B/NIR
Etc	PAN RPC File (text) Auxiliary File(text)



(\*) If image file size > 4GB, image file will be provided for each band

# File Naming Convention

## ❖ File Name

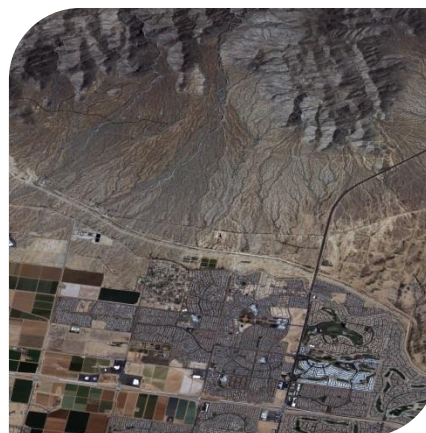
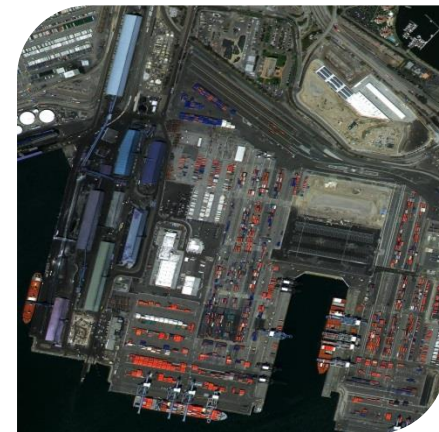
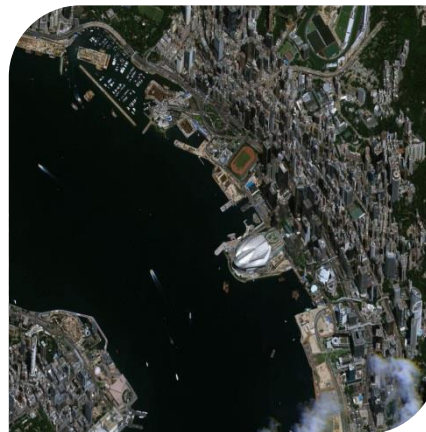
- PAN File : MSC\_”Time”\_”OrbNo”\_”PathRow”**PA**xx\_”Level”.ext
- MS File : MSC\_”Time”\_”OrbNo”\_”PathRow”**MXA**xx**B**\_”Level”.ext
- Pan-Sharp File : MSC\_”Time”\_”OrbNo”\_”PathRow”\_”Level”\_1**mC**.tiff
- Browse/Thumbnail File :  
MSC\_”Time”\_”OrbNo”\_”PathRow”**T**”Level”\_”Type”.**jpg**

## ❖ Description

- Time : Scene Center Time(UTC), **YYYYMMDDHHMMSS**
- Orbit No : 5 digit number of orbit after launch
- PathRow :
  - PPPP: 4 digit path number of K2 Grid
  - rrrr : 4 digit row number of K2 Grid
- Product Level : 1R or 1G
- **MXA**xx**B**:
  - X : MS band (1/2/3/4)
  - A : P(positive)/N(negative) tilt angle
  - xx : tilt angle (first 2 digit)
  - B : Band(R/G/B/N)
- Type : br or tn



# KOMPSAT-3 Image Data



# Product Level

**1R**

- Without GCP
- OD/AD or POD/PAD
- Radiometric Correction
- Sensor Correction
- MTF Compensation
- Geo-information included

**1G**

- Without GCP
- POD/PAD
- Radiometric Correction
- Sensor Correction
- MTF Compensation
- Geometrical Correction
- PAN-MS Registration

# Product Type & Format

## ❖ Bundle

- 1 PAN (0.7m) + 4 MS (R/G/B/NIR: 2.8m)

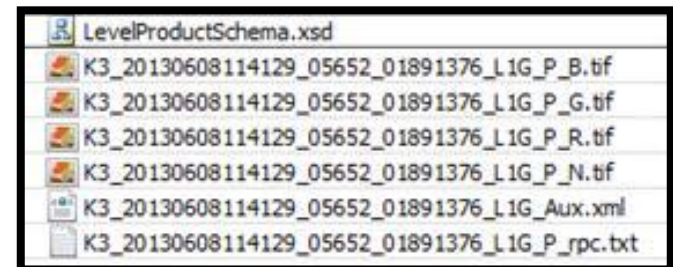
For each Band (PAN, MS1 ~ MS4)	Image File (GeoTiff) RPC File(text)
Etc	Browse Image File (Jpeg) Thumbnail File(Jpeg) Auxiliary File(xml) Schema File(xsd)



## ❖ PAN-Sharpended

- 4 MS : 0.7m (resampled R/G/B/NIR)

MS1 (PAN-MS1)	Image File (GeoTiff)
MS2 (PAN-MS2)	Image File (GeoTiff)
MS3 (PAN-MS3)	Image File (GeoTiff)
MS4 (PAN-MS4)	Image File (GeoTiff)
Etc	PAN RPC File (text) Auxiliary File(xml) Schema File(xsd)





# Product Format

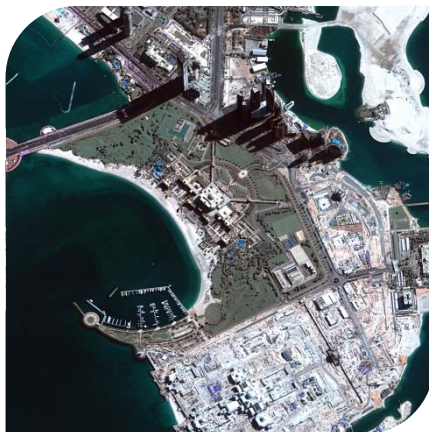
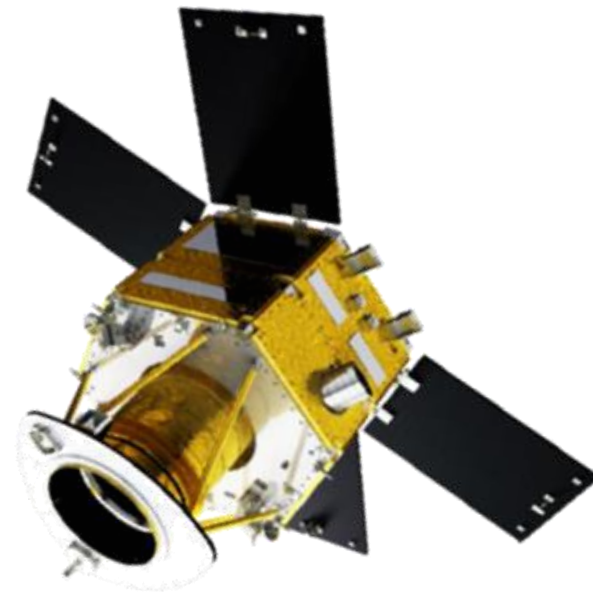
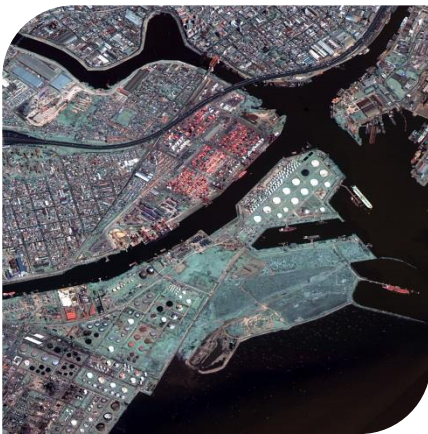
## ❖ File Naming Convention

- Image File : K3\_”Time”\_”OrbNo”\_”ProcLevel”\_”Band”.tif
- RPC File : K3\_”Time”\_”OrbNo”\_”ProcLevel”\_”Band”\_rpc.txt
- Browse/Thumbnail File :  
K3\_”Time”\_”OrbNo”\_”ProcLevel”\_”Type”.jpg
- Auxiliary File : K3\_”Time”\_”OrbNo”\_”ProcLevel”\_Aux.xml

## ❖ Description

- Time : Scene Center Time(UTC), **YYYYMMDDHHMMSS**
- Orbit No : 5 digit number of Orbit after launch
- Product Level : L1R or L1G
- Band :
  - Bundle : P/R/G/B/N
  - Pan Sharpened : P\_R/P\_G/P\_B/P\_N
- Type : br or th

# DubaiSat-2 Image Data



# Product Level

## Radio

- Without GCP
- OD/AD
- Radiometric Correction
- Sensor Correction
- MTF Compensation
- Geo-information included

## Geo

- Without GCP
- OD/AD
- Radiometric Correction
- Sensor Correction
- MTF Compensation
- Geometrical Correction

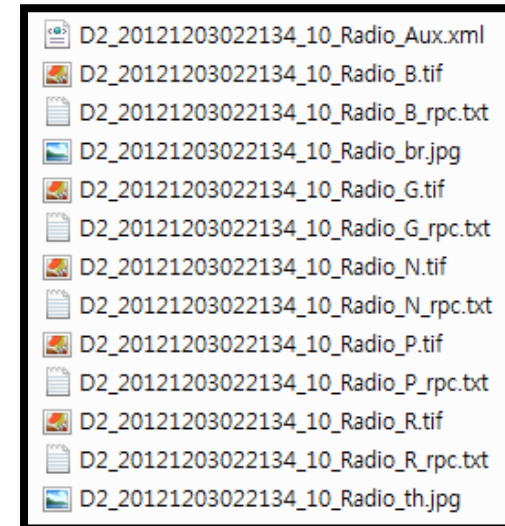


# Product Type & Format

## ❖ Bundle: 1 PAN (1.0m) + 4 MS (4.0m)

### ● Radio product

For each Band (PAN, MS1 ~ MS4)	Image File (GeoTiff) RPC File(text)
Etc	Browse Image File (Jpeg) Thumbnail File(Jpeg) Auxiliary File(xml)



### ● Geo product

For each Band (PAN, MS1 ~ MS4)	Image File (GeoTiff)
Etc	Browse Image File (Jpeg) Thumbnail File(Jpeg) Auxiliary File(xml)

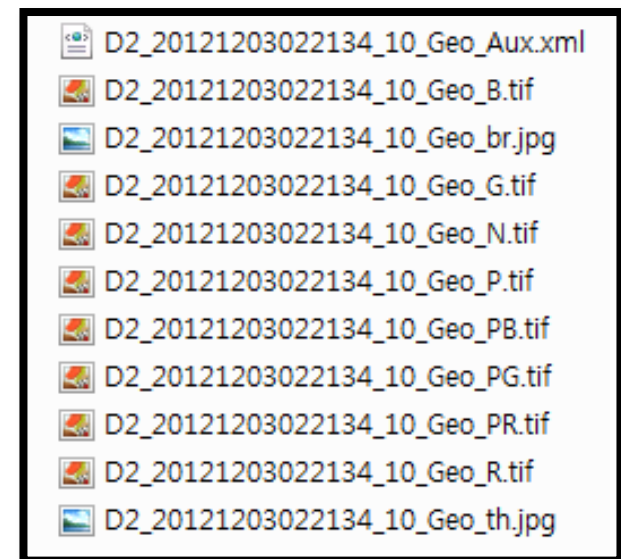


# Product Type & Format

## ❖ Pan-sharpened: 1 PAN (1.0m) + 8 MS (1.0m & 4.0m)

- only for Geo product

PAN, MS1 ~ MS4	Image File (GeoTiff)
Pan sharpened Blue(PB)	Image File (GeoTiff)
Pan sharpened Green(PG)	Image File (GeoTiff)
Pan sharpened Red(PR)	Image File (GeoTiff)
Pan sharpened NIR(PN)	Image File (GeoTiff)
Etc	Browse Image File (Jpeg) Thumbnail File(Jpeg) Auxiliary File(xml)



# Product Format

## ❖ File Naming Convention

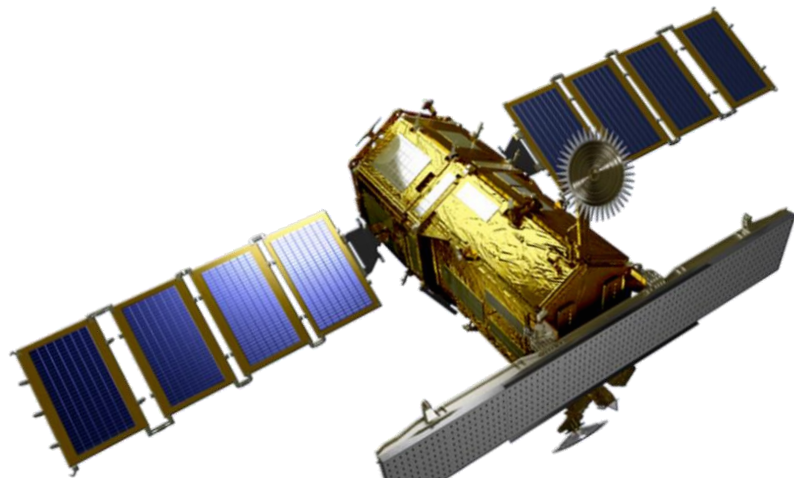
- Image File : D2\_”Time”\_”OrbNo”\_”ProcLevel”\_”Band”.tif
- RPC File : D2\_”Time”\_”OrbNo”\_”ProcLevel”\_”Band”\_rpc.txt
- Browse/Thumbnail File :  
D2\_”Time”\_”OrbNo”\_”ProcLevel”\_”Type”.jpg
- Auxiliary File : D2\_”Time”\_”OrbNo”\_”ProcLevel”\_Aux.xml

## ❖ Description

- Time : Scene Center Time(UTC), YYYYMMDDHHMMSS
- Orbit No : Number of orbit
- Product Level : Radio or Geo
- Band :
  - Bundle : P/R/G/B/N
  - Pan Sharpened : PB/PG/PR/PN
- Type : br or th



# KOMPSAT-5 Image Data



Upgrading processing software &  
Various levels of product will be lined up



# Product level (1/2)

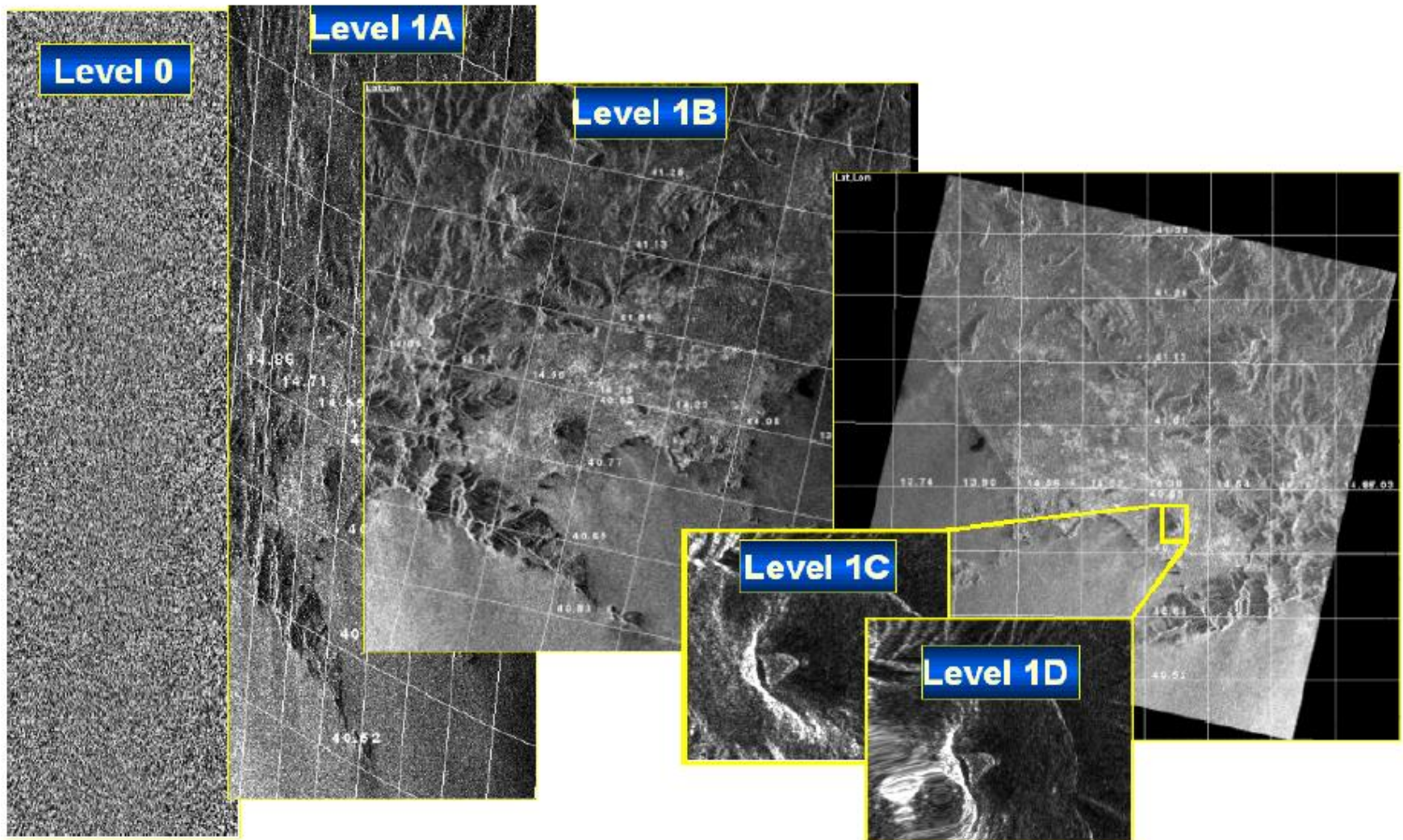


Fig. 4 – The 5 types of COSMO-SkyMed Standard Products (examples from ERS1)



# Product level (2/2)

Level	Product	Description	Projection
Level 1A	SCS_B	In-Phase and Quadrature focused data, weighted and radiometrically equalized vs. slant range losses	Slant Range / Azimuth (Zero-Doppler)
Level 1B	DGM_B	Amplitude of the focused data, multilooked (but for High Resolution Mode)	Ground Range (WGS84 Ellipsoid) / Azimuth (Zero-Doppler)
Level 1C	GEC_B	Amplitude of the focused data, multilooked (but for High Resolution Mode)	UTM ( $-80^{\circ} \leq$ center latitude $\leq 84^{\circ}$ ) UPS (otherwise)
Level 1D	GTC_B	Backscattering coefficient of the observed scene, multilooked (but for HR Mode), with annexed the Incidence Angles Mask	UTM ( $-80^{\circ} \leq$ center latitude $\leq 84^{\circ}$ ) UPS (otherwise)

# Processor Upgrading

- ❖ **Processor Upgrading: Scheduled to be completed by mid of April**
  - Possible to provide sample data using new processor during upgrading
- ❖ **Benefits of new processor**
  - Wider Dynamic range
  - Higher resolution for HR mode image: 1.0m → 0.85m
- ❖ **Product file structure & name convention will be specified after upgrading**



# Contents

I

Image data level, type, and format

II

Ordering parameters

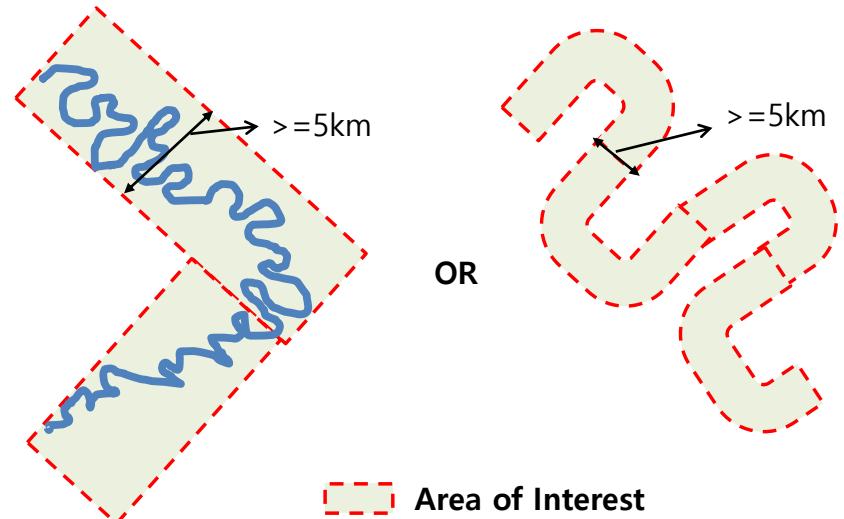
III

Catalogue system & supportive COTS

# Minimum Order Size

## ❖ KOMPSAT-2/3

- For non-stereo pair
  - 100 km<sup>2</sup>(NTO), 25 km<sup>2</sup> (AO)
  - Minimum Swath : 5 km
- For stereo pair
  - 100 km<sup>2</sup> for both NTO and AO
  - Minimum swath : 10 km



## ❖ KOMPSAT-5

- Scene basis

## ❖ DubaiSat-2

- Same as KOMPSAT-2/3



<AOI : before>



<AOI : minimum swath 5 km>

# Delivery & Priority Option

## ❖ KOMPSAT-2/3

- Archive order

Delivery Service	Expected time of delivery
Standard	3 working days
Rush	1 working day

- New Tasking order

New tasking option	Priority	Nominal collection window	Remarks
Priority Plus	Very high	4 days or specific date	Emergency or Assured date
Priority	Higher	4 weeks	
Standard	Standard	12 weeks or more	

# Delivery & Priority Option

## ❖ KOMPSAT-5

- Archive order

Delivery Service	Expected time of delivery
Standard	3 working days
Rush	1 working day

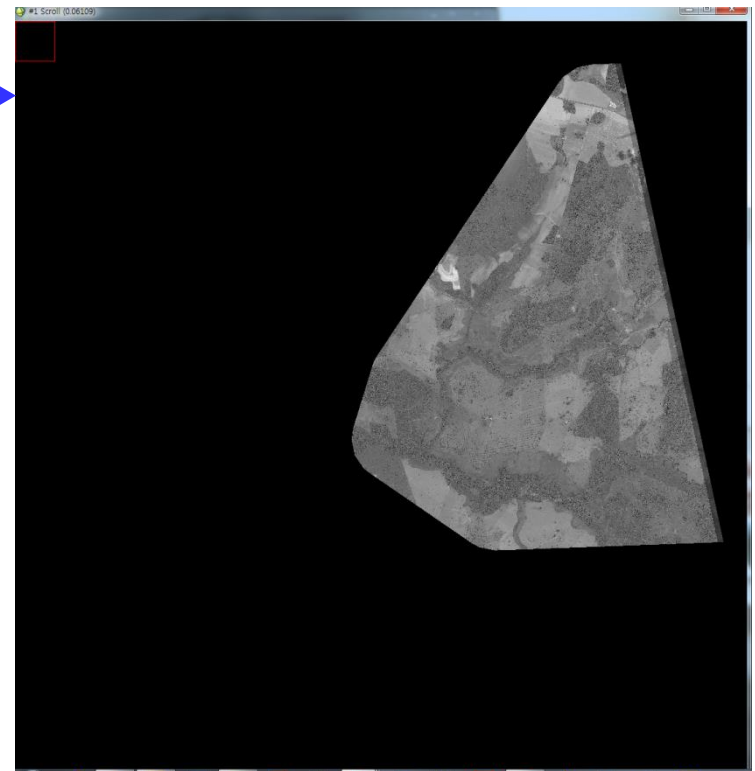
- New Tasking order

New tasking option	Priority	Description
Priority	Higher	Order shall be confirmed until 03:00 UTC one day before start of collection window
Standard	Standard	Order shall be confirmed until 03:00 UTC two days before start of collection window



# AOI Based Product Delivery

- ❖ Images : Black masked for non-AOI
  - With some margin
- ❖ RPC, EPH, Aux : for full scene.



# Contents

I

Image data level, type, and format

II

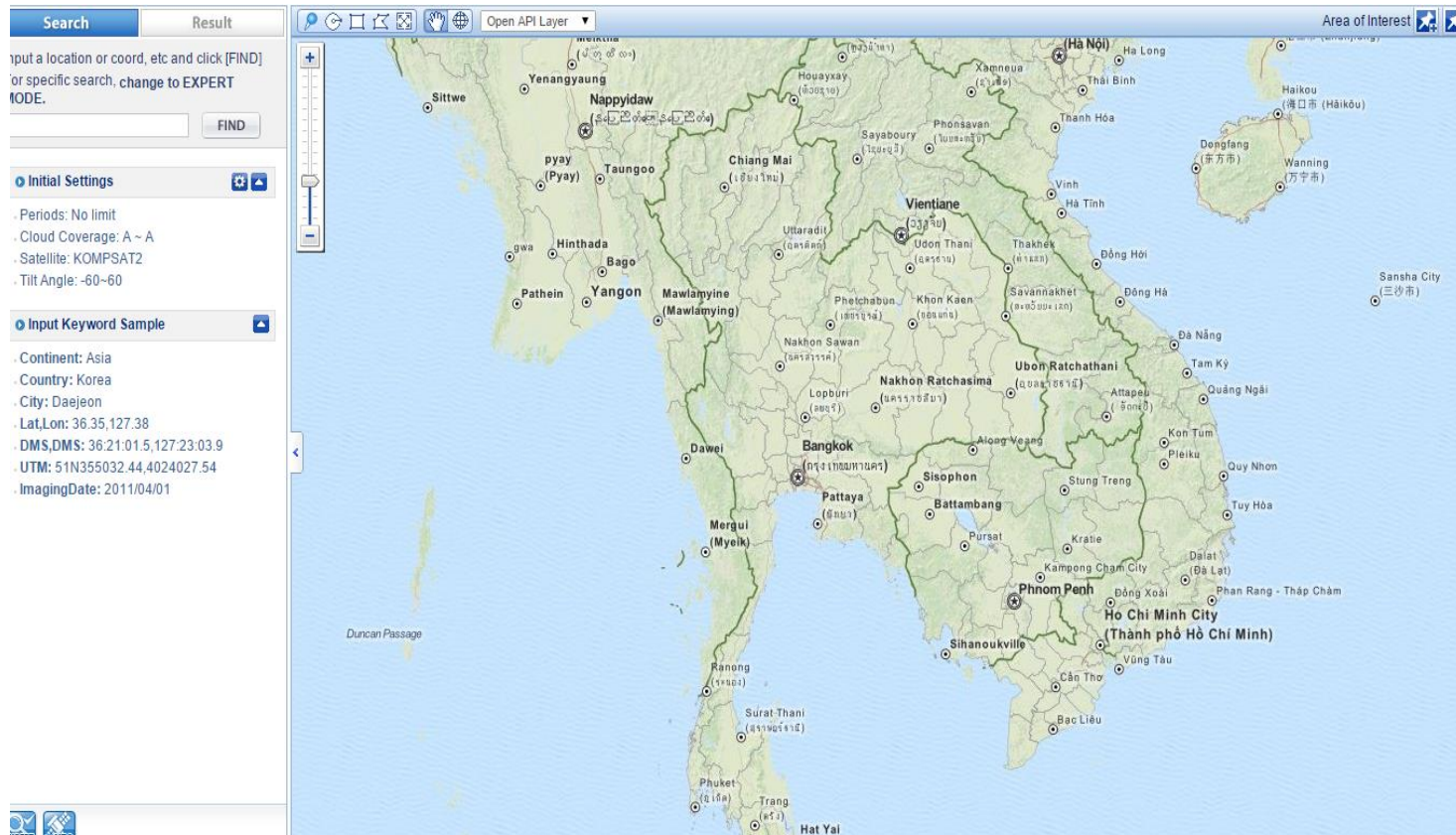
Ordering parameters

III

Catalogue system & supportive COTS

# KOMPSAT – Arirang (1/2)

- ❖ <http://arirang.kari.re.kr>
- ❖ Web-based Catalog Search and Browse System for KOMPSAT-2/3/5



# KOMPSAT – Arirang (2/2)

## ❖ Search Mode

- Without log-in
- Basic Search Condition
  - Imaging Period, Cloud Cover, Satellite, Tilt Angle
  - Area of Interest

## ● Search Result Display

- List on table
- foot print, thumbnail, browse image on map, detailed metadata

## ● Search Result Export

- KMZ, HTML, CSV, SHP

## ❖ Request to GISTDA for detailed search condition

Change Initial Settings

Period: All | 3 Month | 6 Month | 1 Year

Cloud Cover: A(0%) ~ E(100%)

Product Sensor: Select All

- KOMPSAT1
- KOMPSAT2
- KOMPSAT3
- KOMPSAT3A
- KOMPSAT5

Tilt Angle: -30 ~ 30

Buttons: Cancel, OK



<input type="checkbox"/>			K3	A	2013/08/06	0
<input checked="" type="checkbox"/>			K3	A	2013/08/06	0
<input type="checkbox"/>			K3	A		6 0
<input checked="" type="checkbox"/>			K3	A		6 0
<input checked="" type="checkbox"/>			K3	A		6 0
<input checked="" type="checkbox"/>			K3	A		6 0

Format menu:  
To KMZ  
To HTML  
To CSV  
To SHP

Buttons: EXPERT, NTO, AO, CART, Result



# DubaiSat (1/2)

- ❖ <http://uis.eiast.ae/map/map.jsp>
- ❖ Web-based Catalog Search and Browse System for DubaiSat-2

The screenshot displays the DubaiSat User Interface System (UIS) web application. The interface features a top navigation bar with the DubaiSat logo, a 'Search & Order' button, a 'Cart' icon, and an 'Order List' icon. On the right side of the top bar, there are links for 'Notice', 'Login', 'Register', and 'Manual'. Below the navigation bar, the main content area is divided into a left sidebar and a central map area. The sidebar contains a 'Search' tab and a 'Result' tab. The 'Search' tab includes a search input field and a search button. Below the search field, there are sections for 'Initial Settings' and 'Keyword Sample for Location'. The 'Initial Settings' section lists parameters such as 'Periods: No limit', 'Cloud Coverage: A ~ E', 'Satellite: DubaiSat-2', and 'Tilt Angle: -30 ~ 30'. The 'Keyword Sample for Location' section lists parameters such as 'Continent: Asia', 'Country: UAE', 'City: Dubai', 'Lat, Lon: 25.26, 55.29', 'DMS, DMS: 25:16:01.5, 55:19:03.9', and 'UTM: 40N330000.00, 2796000.00'. The 'Keyword Sample for Catalog' section lists parameters such as 'ImagingDate: 2011-12-31', 'PassID: K3\_PASS\_00000024', and 'Orbit: 10285'. The central map area shows a map of Southeast Asia, including Myanmar (Burma), Laos, Thailand, Vietnam, Cambodia, and Hainan. The map is centered on the coordinates 102.21680°E, 16.79402°N. The map includes various geographical features, cities, and regions. The bottom of the map area shows the Google logo and the text 'Map data ©2015 AutoNavi, Google, SK planet, ZENRIN'.

# DubaiSat (2/2)

## ❖ Search Mode

- Without log-in
- Basic Search Condition
  - Imaging Period, Cloud Cover, Tilt angle
  - Area of Interest
- Search Result Display
  - List on table
  - foot print, thumbnail, browse image on map, detailed metadata
- Search Result Export
  - KMZ, HTML, CSV, SHP

## ❖ Request to GISTDA for detailed search condition

Change Initial Settings

Period: All | 3 Month | 6 Month | 1 Year

2014-12-14 ~ 2015-03-14

Cloud Cover: A(0%) ~ E(70-90%)

Product Sensor: Select All

DubaiSat-2

Tilt Angle: -30 ~ 30

Cancel OK



<input type="checkbox"/>		D-2	A	2014-09-14	0
<input checked="" type="checkbox"/>		D-2	A	2014-09-14	0
<input type="checkbox"/>		D-2	A	2014-09-14	0
<input type="checkbox"/>		D-2	A	2014-09-14	0
<input checked="" type="checkbox"/>		D-2	A	2014-09-14	0
<input checked="" type="checkbox"/>		D-2	A	2014-09-14	0

Format

- To KMZ
- To HTML
- To CSV
- To SHP



# Supportive COTS

## ❖ KOMPSAT-2/3

- PCI Geomatica 2013
- ENVI 5.1
- ERDAS 2014
- Pixel Factory 2014

## ❖ KOMPSAT-5

- PCI Geomatica: Geomatica 2014 Service Pack 2
- ENVI SARscape 5.1 (preliminary support) / 5.2 (scheduled)
- ERDAS: ERDAS v14.1 patch
- GAMMA Remote Sensing (patch for test is available)

## ❖ DubaiSat-2

- PCI Geomatica 2015 (scheduled)
- ERDAS (scheduled in second quarter of 2015)



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