



# ASI IPY PORTFOLIO

## TO SUPPORT THE INTERNATIONAL POLAR YEAR ACTIVITY USING THE HIGH RESOLUTION SAR DATA OF THE COSMO-SKYMED MISSION

### ASI High Resolution Data Portfolio

The ASI high resolution data portfolio for the IPY consists of products from the COSMO-SkyMed Mission, the Italian constellation composed of 4 X-band SAR satellites devoted to the monitoring and the observation of the Earth.

At this time three satellites have been successfully launched, the fourth one will be launched in 2010. Short descriptions of the Mission main characteristics and the SAR sensor acquisition modes (more information about the details of the Mission and the system can be found on the COSMO-SkyMed website at the following address <http://eopi.asi.it>, see "Previous AO page") are reported in the following:

### Mission Characteristics

#### Main Mission Elements

<b>Number of Satellites</b>	3	(4 with full constellation).
<b>Inclination</b>	97.86°	
<b>Revolutions/day</b>	14.8125	
<b>Orbit Cycle</b>	16 days	
<b>Interferometric repeat cycle</b>	8 days (also 1 day possible)	(4 days with full constellation).
<b>Eccentricity</b>	0.00118	
<b>Argument of Perigee</b>	90°	
<b>Semi Major Axis</b>	7003.52 km	
<b>Nominal Height</b>	619.6 km	
<b>LTAN</b>	6:00 A.M.	
<b>Phasing</b>	90°	
<b>Launches</b>	COSMO-1: June, 8 <sup>th</sup> 2007 – COSMO-2: December, 9 <sup>th</sup> 2007 - COSMO-3: October, 25 <sup>th</sup> 2008 COSMO-4: beginning of 2010	
<b>Launches Scheduled</b>	COSMO-4: beginning of 2010	
<b>Mission Type</b>	Dual: Military and Civilian (Scientific/Institutional/Commercial)	

*Table 1 - COSMO-SkyMed Main Mission Elements*

#### Imaging Mode Parameters

<b>Antenna look direction</b>	right (standard) and left
<b>Polarization</b>	HH, VH, HV, VV (single & Ping Pong mode: alternating polarisation allowing a couple of images between HH, VV, HV, VH)
<b>Imaging modes</b>	StripMap HIMAGE, Ping Pong, ScanSAR HR, ScanSAR WR, Spotlight

*Table 2 - COSMO-SkyMed imaging modes parameters*

#### Time Performance

	3 satellites	Full constellation
<b>Information age</b>	12 h	12 h
<b>Response Time</b>	85 h	72 h
<b>Revisit time</b>	35.5 h	12 h

*Table 3 – Timing performances of the COSMO-SkyMed constellation (worst cases all over the world)*



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## SAR Acquisition Modes

### STRIPMAP HIMAGE Parameter Value

Swath	40 x 40 km
Ground Range and Azimuth Resolution	3 m (1 look) – 5 m
Full performance in the nominal incidence angle range	25° - 50°
Extended incidence angle range:	20° - 59,5°
Polarizations	Single, selectable among HH or HV or VH or VV

Table 4 - Parameters of Stripmap HIMAGE Mode

### PING-PONG Parameter Value

Swath	30 x 30 km
Ground Range and Azimuth Resolution	15 m
Full performance in the nominal incidence angle range	25° - 50°
Extended incidence angle range:	20° - 59,5°
Polarizations	Alternating polarisation: 2 polarisations selectable among HH, VV, VH and HV

Table 5 - Parameters of PING PONG Mode

### SPOTLIGHT Parameter Value

Swath	10 x 10 km
Ground Range and Azimuth Resolution	1 m
Full performance in the nominal incidence angle range	25° - 50°
Extended incidence angle range:	20° - 59,5°
Polarizations	Single, selectable among HH or VV

Table 6 - Parameters of Spotlight Mode

### ScanSAR WR Parameter Value

Swath	100 x 100 km
Ground Range and Azimuth Resolution	30 m
Full performance in the nominal incidence angle range	25° - 50°
Extended incidence angle range:	20° - 59,5°
Polarizations	Single, selectable among HH or HV or VH or VV

Table 7 - Parameters of ScanSAR WR Mode

### ScanSAR HR Parameter Value

Swath	200 x 200 km
Ground Range and Azimuth Resolution	100 m
Full performance in the nominal incidence angle range	25° - 50°
Extended incidence angle range:	20° - 59,5°
Polarizations	Single, selectable among HH or HV or VH or VV

Table 8 - Parameters of ScanSAR HR Mode

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### Scientific Use of the COSMO-SkyMed Data

Every use of COSMO-SkyMed data and products not pursuing a commercial profit oriented use is a *Scientific Use*

The Scientific Use status needs to be selected via a specific process managed by ASI under the data policy regulation..

The first COSMO-SkyMed Announcement of Opportunity was released in May 2007 and closed in September 2007.

### COSMO-SkyMed Data Access

The COSMO-SkyMed data access is ruled by the COSMO-SkyMed data policy, where Civilian (Scientific, Institutional and Commercial) and Defence users share System resources under appropriate regulation.

The COSMO-SkyMed interface portal ([www.cosmo-skymed.it](http://www.cosmo-skymed.it)) for scientific and institutional users allows the access to the COSMO-SkyMed Mission products.



*Fig. 1: - COSMO-SkyMed Institutional User Portal (Example).*