

COSMO-SkyMed

The first radar constellation
for operational applications and services

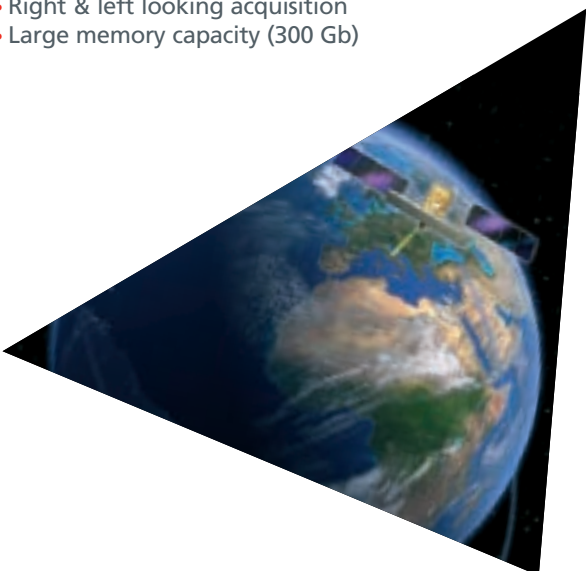
COSMO-SkyMed, one of the most innovative Earth Observation programmes, is financed by the Italian Space Agency, the Ministry of Defence and the Ministry of Education, Universities and Scientific Research. The COSMO-SkyMed system involves a constellation of four satellites equipped with radar sensors that can operate under any weather or visibility conditions and with a very high revisit frequency. COSMO-SkyMed was conceived as a programme to meet civil (environment, civil protection, Oil&Gas) and defence objectives (surveillance).

The overall features of the system allow it to interoperate with other systems and to be used within the context of international agreements.

In particular, COSMO-SkyMed will be able to meet the stringent operating requirements of the European Union / ESA GMES programme (Global Monitoring for Environment and Security).

Technical Overview

- Constellation of 4 radar satellites
- Orbit altitude (620 Km)
- High revisit frequency
- Active array X Band antenna with steerable beam
- Wide bandwidth (400MHz)
- High geo location accuracy with worldwide trusted GPS network
- Wide incidence angle ($20^\circ \div 59^\circ$)
- Right & left looking acquisition
- Large memory capacity (300 Gb)



Key characteristics

Reliability and continuity

First generation

- Four COSMO-SkyMed X band satellites

Integration with other missions

- Two SAOCOM L-band satellites

Second Generation

- COSMO-SkyMed second generation being developed by ASI and Italian Ministry of Defense (launching by 2014), will guarantee innovation and continuity with the current system

Best geometric resolution

- 400 MHz chirp bandwidth
- 1m resolution from 25° to 59° incidence angle
- Image size 10 x 10 km @ 1m resolution

Best revisit time

With 4 satellites

- At equator 4 images per day
- At 40° latitude, every 7 hours (average)

Fast response time

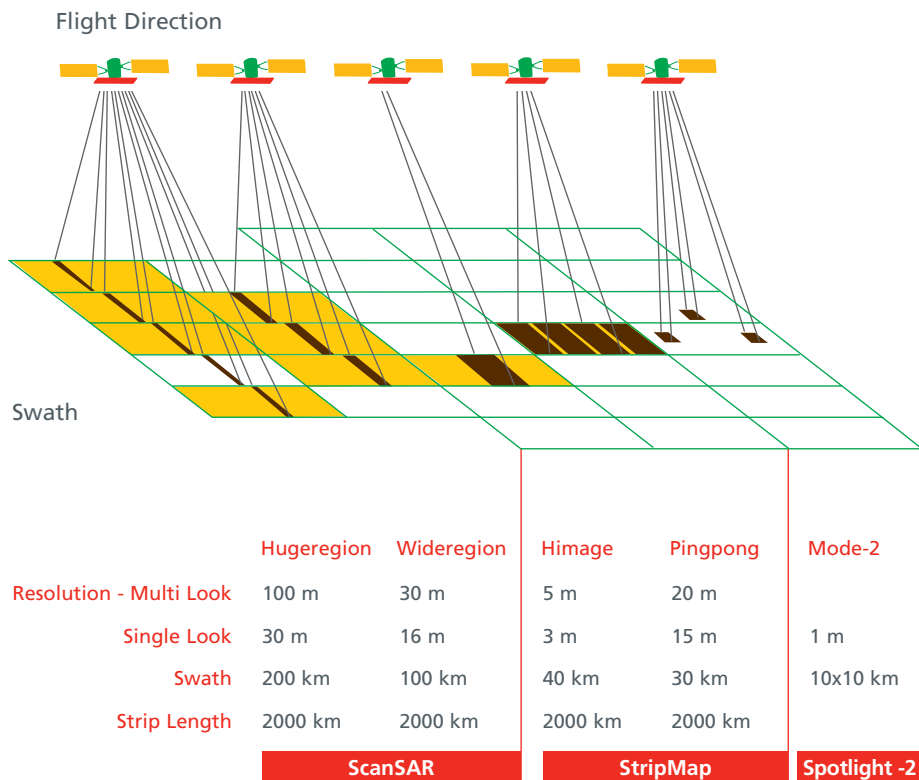
An image will be made available 24 to 48 hours after the request has been approved

Large collection capability

With 4 satellites up to 1800 images per day

Daily scenario example:

- 300 Spotlight-2 = 30,000 km² at 1m resolution
- And
- 1,500 Stripmap = 2,400,000 km² at 3m resolution



COSMO-SkyMed image over the Ross bay, Antarctica, October 2009
COSMO-SkyMed © ASI
processed and distributed by e-GEOS

ScanSAR



COSMO-SkyMed image over the Kerch strait between Ukraine and Russia, November 2007
COSMO-SkyMed © ASI
processed and distributed by e-GEOS

StripMap



COSMO-SkyMed image over Manhattan, New York, US, January 2010
COSMO-SkyMed © ASI
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Spotlight -2



Near-Real Time data acquisition

Through the Customer User Terminal (CUT), e-GEOS can provide direct reception of imagery from the COSMO-SkyMed constellation from any point on the globe to clients having a ground station. The CUT consists of a processing facility, easily deployed worldwide in a short amount of time. If needed, a full ground segment system can be provided, including antenna. The CUT allows planning and submission of tasking requests at short notice. Furthermore, upon image acquisition, products can be generated in just a few minutes.

e-geos

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Spotlight -2
COSMO-SkyMed image
over Vancouver, Canada,
January 2010
COSMO-SkyMed © ASI
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