

EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Session on Earth Observation (7)

Author: Mr. Carsten Tobehn
OHB System AG-Bremen, Germany, tobehn@ohb-system.de

Mr. Boris Penné
OHB System AG-Bremen, Germany, penne@ohb-system.de

Mr. Bent Ziegler
OHB System AG-Bremen, Germany, bent.ziegler@ohb.de

Mr. Frank te Hennepe
OHB System AG-Bremen, Germany, frank.tehennepe@ohb-system.de

Dr. Wei Sun
OHB System AG-Bremen, Germany, w.sun@ohb-system.de

FUTURE CONCEPTS FOR EARTH OBSERVATION MISSIONS

Abstract

This paper provides the outline of near future Earth Observation concepts currently investigated on national or European level. These concepts ranging from hyperspectral science and research towards operational very high resolution constellations for security services. Special topics presented are operational Greenhouse-Gases monitoring, operational coastal zone monitoring from GEO, as well as maritime surveillance:

- **Very high resolution SAR and optical mission** below 1m resolution are proposed for reconnaissance and dual-use applications. The main user requirement is a fast system response time. Regarding this topic, next generation system core elements will be presented.
- **EnMAP** is featuring innovative hyperspectral sensor systems for detailed and global analysis of eco-system parameters. The sensor provides more than 200 spectral channels from VNIR to SWIR with a spatial resolution of 30m.
- **CarbonSat** provides to the global measurement of Greenhouse Gases (CO₂ and CH₄) to enable reliable source/sink characterization. A constellation of Carbon-Satellites provides independent emission verification with transparency. A international operational constellation of five CarbonSat satellites is the solution to acquire daily global CO₂ and CH₄ measurements.
- **Ocean-Colour from GEO** will be a sustainable source of intra-daily data relevant to coastal zone services relating to environment monitoring, fisheries management and coastal water pollution. The system will provide 14 spectral channels in VNIR with 300m spatial resolution. This will complement the GMES Sentinel-3 mission where Sentinel-3 provides higher resolution and the OC-GEO provides frequent revisit.
- **Space-based Automatic Identification System (AIS) Constellation** is designed as a system of small AIS satellites for receiving logistic and navigation data from ships. The system already exists on a terrestrial basis for coastal areas but the introduction of a satellite system will enable global ship detection. Optical or radar ship detection will complement the data for the maritime surveillance.

For security applications, fast delivery of large data volumes is an issue for all very high resolution systems. GEO data relay satellites are currently investigated as a possible solution for the growing demand of data traffic from EO satellites to ground stations.

A common factor in the varied selection of missions is that high performance can be achieved with small satellites, which enables a faster development and lower overall cost. The mission concepts will be outlined as well as the key features of payloads, and overall systems.