

EARTH OBSERVATION SYMPOSIUM (B1)
International Cooperation in Earth Observation Missions (1)

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FUTURE CONCEPTS FOR EARTH OBSERVATION MISSIONS

Abstract

This paper provides an overview of recently deployed SAR-Lupe constellation as well as new concepts in the field of Earth Observation systems for Germany and Europe ranging from science and research towards operational missions. Very high resolution multi-spectral, hyperspectral, as well as very high resolution SAR mission concepts are presented including the following projects:

- The SAR-Lupe constellation will generate very high resolution SAR images of 1m for military reconnaissance purposes with fast response time, currently in-orbit deployment. The constellation provides inter-satellite-links and will be operated for 10 years.
- EnMap - featuring innovative hyperspectral sensor systems for the detailed and global analysis of eco-system parameters. The sensor provides more than 200 spectral channels from VNIR to SWIR with spatial resolution of 30m.
- High resolution SAR and optical constellations of 1m resolution are currently investigated for emergency response services. The main user require is a fast system response-time. The constellations in combination with current and planned systems will offer unprecedented fast response times.
- Very high resolution SAR and optical mission below 1m resolution are proposed for reconnaissance and dual-use applications of governmental customer. Here next generation system core elements are presented.
- Space-based Automatic Identification System (AIS) Constellation. Also related to Earth Observation a system of small AIS satellites is designed for receiving logistic and navigation data from ships. The system exists for coastal areas but the introduction of a satellite system will enable global maritime surveillance.
- Ocean-Colour from GEO will be a sustainable source for intra-daily data relevant for coastal zone services for 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.

Also the fast delivery of large data volumes is an issue for very high resolution systems. Here GEO data relay satellite are currently investigated as a possible solution for the growing demand of data traffic from EO satellite to ground stations. Common to the varied selection of missions is that high performance can be achieved with small satellites enabling a faster development and lower overall cost. The mission concepts will be outlined as well as the key features of payloads, platforms and overall systems.