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Vortragstitel	Future Fine Scale Satellite Radar Altimetry Architectures using a Small Satellites Constellation for Large Scale and Mesoscale Oceanography
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Abstract

The launch of TOPEX/POSEIDON in 1992 marked the beginning of continuous radar altimetry ocean monitoring. Since then the community of ocean altimetry data users has grown significantly and today the data is used from fundamental ocean and climate (change) research to operational sea weather forecasts.
TOPEX/POSEIDONSs successors are the Jason series satellites, with Jason-1 and Jason-2 currently in orbit and Jason-3 en-route for a launch in 2013, replacing the aging Jason-1 satellite. The measurements from the Jason satellites are complemented by the radar altimetry data from missions in polar (sun-synchronous) orbits. Polar radar altimetry measurements will be continued and improved by the satellites of the Sentinel-3 series, starting with Sentinel-3A, which is as well scheduled for launch in 2013.
Beyond the timeframe of the Sentinel-3 series satellites the future of satellite altimetry remains unclear. ESA has initiated a study that aims to look into the feasibility of accommodating an altimeter with associated instrumentation on a small satellite platform. The main idea is the deployment of small satellite constellations in low earth orbit (LEO) to fulfil the needs of oceanography in the future. The aim of these constellations is to provide additional support to the aforementioned satellites by further improving altimetry measurements. Different constellations using small, identical, altimetry-dedicated satellites providing improvements to the temporal and spatial quality of the measurements have been defined and analysed. The goal is to monitor mesoscale phenomena which typically require a measurement grid resolution better than 100km. Opportunities to provide long term very high spatial resolution measurements and very rapid but low spatial resolution measurements have been identified and are shown in the paper. The smallest constellation presented provides a measurement grid of 50km spatial resolution and gathers a complete data set every week. The key requirements driving the constellation design (temporal and spatial resolution of the measurements) and satellite design (large payload and multi-launch capabilities) are presented and their impacts discussed.
The altimetry instrumentation used in the study is mainly based on the Sentinel-3 radar altimetry payload suite, which represents state-of-the-art technology. It consists of a SRAL-like dual-frequency (Ku- and Cband) altimeter, a dual-frequency microwave radiometer, a next generation GNSS receiver and a Laser Retro-Reflector.

The starting point for the satellite design has been OHB System's generic satellite platform for low Earth orbit missions the LEOBUS-1000. Several modifications, like a new structure design or a smaller payload data handling subsystem have been implemented to reduce the cost of the satellite and system. Different structure options that have been evaluated for the multi launch design.