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EARTH OBSERVATION SYMPOSIUM (B1)
Future Earth Observation Systems (2)

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OCEANOGRAPHIC CONSTELLATION MODELLING FOR FINE SCALE ALTIMETRY

Abstract

There has been an interest in the use of altimeter constellations to provide timely information for sea state and scientific information. A small satellite altimeter mission constellation has the potential to offer timely coverage of the oceans and in particular coastal zones and possibility in-land water in order to measure parameters such as sea surface height etc. The type of altimeter constellations being proposed could provide additional capability to the presently planned high precision altimeter missions and would be characterised by a lower in-orbit cost. The constellation approach would enable higher measurement density (depending on the constellation set-up) together with robust degradation and redundancy.

SSTL has been involved in the conception and design of constellations of altimeters since early 2000 when it proposed the development of the GANDER Mission and was part of the European team that studied the mission under the GAMBLE programme. More recently this type of mission was studied for ESA analysing areas where small satellites can provide additional capability to the presently defined GMES constellation..

SSTL is currently leading a European team comprising oceanographers, modellers and algorithm developers to undertake an ESA study into the scientific assessment of fine scale altimetry using a constellation of small satellites. The SSTL consortium includes, the National Oceanographic Centre in Southampton (UK), The UK Met Office, Satellite Oceanographic Consultants (UK) and Thales Alenia Space (F).

The aim of this activity is to parametrically establish the link between altimetry satellite constellation characteristics and the final end-to-end performance levels needed derive ocean circulation patterns, coastal phenomena and in-land water monitoring. The first part of the study involves a survey of user needs and the subsequent development of an assessment model which will be driven by realistic oceanographic data sets and this will facilitate detailed end to end analysis. The emphasis of the work will be to assess different satellites constellation configurations to assess mesoscale and other features against an agreed set of oceanographic, coastal and possibly in-land water type scenarios and vice versa.

This paper will present the background to the programme and the status of the activities being undertaken.