I - The application of medium grazing angle sea-clutter models

II - The NRL multi-aperture SAR : system description and recent results

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Luke Rosenberg received his Bachelor of Electrical and Electronic Engineering in 1999, Masters in Signal and Information Processing in 2001, and PhD in 2006, all from the University of Adelaide in Australia. In 2000 he joined the Defence Science and Technology Organisation as an RF engineer, then worked as a research scientist in the imaging radar systems group and recently in the maritime radar group. He is also an adjunct senior lecturer at the University of Adelaide and is currently on attachment at the US Naval Research Laboratory working on algorithms for focussing moving scatterers in synthetic aperture radar imagery.

His interests are in the areas of radar signal processing and the modelling and simulation of radar backscatter. In particular, his work has covered radar image formation, adaptive filtering, detection theory, and radar and clutter modelling. He is an active member of the SET-185 NATO panel on high grazing angle sea-clutter and has published over 50 conference, journal and technical reports.

Talk 1 – The application of medium grazing angle sea-clutter models

There is a large body of literature on sea-clutter analysis and modelling. However, these are mostly from radars with coarse resolution with data collected at low grazing angles. Newer maritime airborne radars which operate at higher resolutions and from higher grazing angles will therefore require newer models to characterise this sea-clutter. The DSTO Ingara medium grazing angle dataset was collected for this purpose and has resulted in a significant amount of work both internally at the DSTO and through the NATO SET-185 group on high grazing angle sea-clutter. This talk discusses the modelling of this data set and its application to realistic sea-clutter simulation and performance prediction modelling.

Talk 2 – The NRL multi-aperture SAR: system description and recent results

The Naval Research Laboratory (NRL) multi-aperture synthetic aperture radar (MSAR) is an airborne test bed designed to investigate remote sensing and surveillance applications that exploit multiple along-track phase centers, in particular, applications that require measurement of scene motion. The system operates at X-band and supports 32 along-track phase centers through the use of two transmit horns and 16 receive antennas. As illustrated in this presentation SAR images generated with these phase centers can be coherently combined to directly measure scene motion using the Velocity SAR (VSAR) algorithm. In September 2014, this unique radar was deployed for the first time on an airborne platform, a Saab 340 aircraft. This presentation presents a description of the system, initial images from the September 2014 tests, and the results of initial coherent analyses to produce estimates of scene and target motion. These images were collected over an ocean inlet and contain a variety of moving backscatter sources, including automobiles, ships, shoaling ocean waves, and tidal currents.

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