A Seminar on:
Passive Radar using DVB-T Signals

Speakers:
Heiner Kuschel & Martin Ummenhofer

Venue: 50 Nanyang Drive, Research Techno Plaza, BorderX Block,
Reality Theatre, 2nd Storey, Singapore 637553
Date: 13 March 2012 (Tue)
Time: 9.00am to 3.30pm

Abstract:
This lecture will consist of two parts. In the first part we will discuss general aspects of passive radar ranging from constraints related to the bistatic geometry of passive radar systems to signal processing aspects of digital COFDM waveforms. Target RCS aspects will be considered as well as propagation phenomena related to the inherent bistatic geometry and UHF-frequency range. Since passive radar systems are generally considered as a multistatic network of sensors emphasis will be laid on the sensor configuration. The experimental systems developed and operated at Fraunhofer FHR will be used as system examples to show possible realisations, performance figures and limitations. The feasibility of passive radar operation will be discussed based on measurement results from various trials performed with FHR experimental systems.

The second part will illustrate the modelling capabilities for passive DVB-T radar systems at FHR. It will deal with a specific single frequency network situation in Europe and address local coverage, sensor location optimisation and network planning. The simulation tool, which has been developed at FHR, is based on real DAB and DVB-T signals and the signal processing implemented in the experimental systems and demonstrators of FHR.

Biography of Speakers:

HEINER KUSCHEL was born in Cologne in Germany in 1955. In 1980, he received the Diploma in Electrical Engineering from the Technische Hochschule Aachen with emphasis on HF-techniques. The primary subjects of his work are: VHF-Radar, propagation prediction modelling, RCS, and radar systems. This also includes consultancy to the German ministry of defence on industry projects. He has been managing the experimental low frequency radar projects LARA and LARISSA of FGAN and is now leading the passive covert radar team of Fraunhofer FHR. He is responsible for the research project ‘semi-active radar for low level coverage’ and the mobile experimental radar projects CORA, DELIA and PETRA. He has been working in NATO research study groups of DRG panel X since 1984 and has been leading several SET technical teams. He is currently the team leader of the NATO-RTO task group SET152 on deployable multi-band passive/active radar for air defence.

MARTIN UMMENHOFER was born in Bonn Germany in 1981. In 2008 he received his diploma in physics at the Rheinische Friedrich-Wilhelms-Universität Bonn with emphasis on detector physics. Since 2009 he works as a scientist at the FHR, Research Institute for High Frequency Physics and Radar Techniques of FGAN (Forschungsgesellschaft für angewandte Naturwissenschaften e.V.), since 2009 Fraunhoferinstitut für Hochfrequenzphysik und Radartechnik in Werthhoven. His work focuses on signal processing for PCL (Passive Coherent Location) systems using OFDM (Orthogonal Frequency Division Multiplexing) waveforms as well as the development of simulation tools for their performance evaluation.

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