



## Personal information

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## About the Author

Joachim H. G. Ender is the director of the Research Institute for High Frequency Physics and Radar Techniques (FHR) at FGAN, and as such he is responsible to the German MOD for all FGAN defence related radar research activities. He graduated from the University Münster / Germany in mathematics and physics. In 1976 he joined the Research Establishment of Applied Science (FGAN), where he worked on statistical theory of detection and estimation, phased array technology, imaging radar, and other radar signal processing problems. He received the PhD from the Ruhr-University Bochum in electrical engineering. Since 1992 he gives annual lectures on radar signal processing at the Ruhr-University Bochum which conferred the title Honorary Professor upon him in 2002. He also gives lectures on radar techniques at the Technical Elite-University RWTH Aachen and the University of Siegen.

Joachim H. G. Ender is author and co-author of numerous papers and frequently serves as a reviewer for various international journals and conferences. In 1996, he was one of the founding members of the EUSAR. He is senior member of IEEE, member of ITG/VDE and DGON.

## Research interest

Design of advanced experimental SAR/MTI systems. Very high resolution SAR imaging, 3D-SAR, multi-baseline and wideband processing techniques for across-track SAR interferometry, ground moving target indication with air and space-based radar including multistatic satellite constellations, inverse SAR for moving target imaging and bistatic SAR processing.

## Summary

### Airborne SAR/MTI

Synthetic aperture radar provides high-resolution images of the non-moving ground scene, but fails for the indication and positioning of moving objects. A short review of the effects occurring in the SAR image caused by object motion will open this tutorial. Like in special airborne MTI systems the solution to the MTI problem is to use an array of antennas or subapertures and several receiving channels ('MSAR' =multi-channel SAR).

A popular method for the recognition of motion is ATI (along track interferometry) applied to a pair of phase centers. ATI yields image-like interferograms with high information content but fails for instance for the azimuth re-positioning of moving target signals interfered by clutter.

One of the most efficient methods is adaptive space-time processing (STAP), which can be simplified to frequency-dependent spatial processing in the Doppler domain.

In this tutorial, some of these techniques applied to SAR are reviewed and illustrated with data gathered by experimental systems of FGAN.