Invitasjon

Norsk MTT/AP avdeling har gleden av å invitere deg til å delta på et heldags-seminar den 16. nov hos FFI på Kjeller. Prof. Peter de Maagt og Prof. Werner Wiesbeck vil presentere følgende foredrag:

Peter de Maagt

Antenna and Submillimetre Wave Section
Electromagnetics & Space Environments Division
European Space Agency

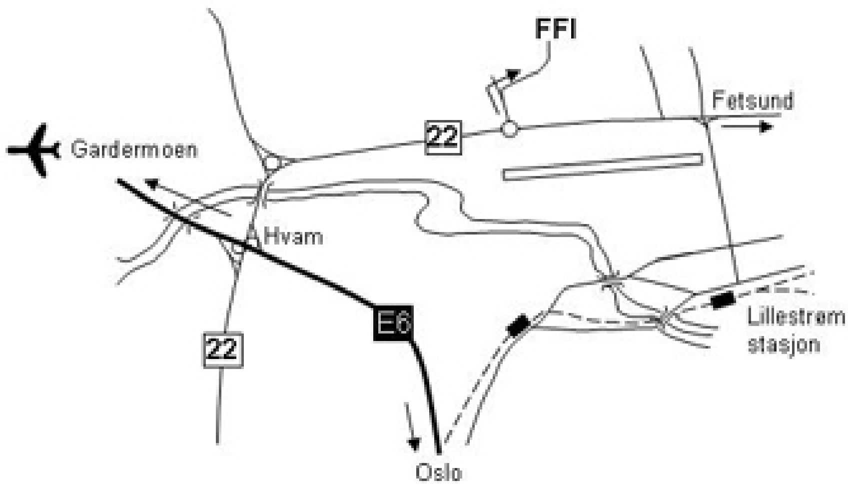
Werner Wiesbeck

Inst. für Höchstfrequenztechnik und Elektronik
Universität Karlsruhe (TH)

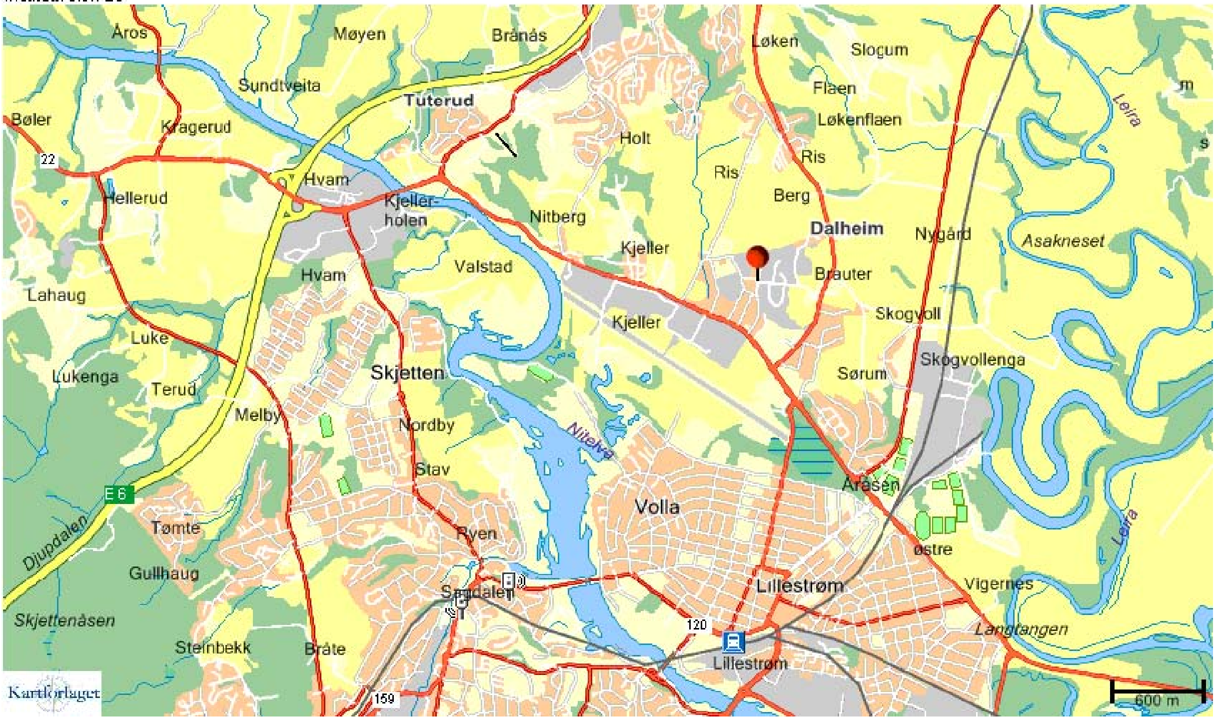
16 nov 2007

0900 – 0910	Introductions and practical information
0910 – 1030	Electromagnetic Bandgap Materials
1030 – 1045	Short coffee break
1045 – 1215	UWB Antennas and Channel Characteristics
1215 – 1300	Lunch
1300 – 1445	Terahertz Technology for Space and Earth Applications
1445 – 1500	Short coffee break
1500 – 1615	3D Propagation Modeling and Characteristics for High Speed Mobiles

Vert for dagen er Sjefsforsker Tor-Odd Høydal, FFI. Telefon 63807256, Mobil 99096484



Instituttveien 20



Møtested: Forsvarets forskningsinstitutt, Instituttveien 20, 2027 Kjeller. For nærmere beskrivelse se www.ffi.no under fanen "Kontakt oss".

Vi ber dere om å melde dere på innen **9. november** ved å sende mail til Eric Wheatley ew@ieee.org

Vennlig hilsen
2007 styret.

Chair:	Ulrik Hanke	Vestfold University College ulrik.hanke@hive.no, 33 03 11 57
Vice chair	Yngve Thodesen	Nera Networks, Bergen ythod@ieee.org, 55 22 55 02
Sec./Treas.:	Eric Wheatley	Nera Networks, Bergen ew@ieee.org, 55 22 52 95

Peter de Maagt

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Peter de Maagt was born in Pauluspolder, The Netherlands, in 1964. He received the M.Sc. and Ph.D. degrees from Eindhoven University of Technology, Eindhoven, The Netherlands, in 1988 and 1992, respectively, both in electrical engineering. In the period 1992/1993 he was station manager and scientist for an INTELSAT propagation project in Surabaya, Indonesia. He is currently with the European Space Research and Technology Centre (ESTEC), European Space Agency, Noordwijk, The Netherlands. His research interests are in the are of millimetre and submillimeter-wave reflector and planar integrated antennas, quasioptics, electromagnetic bandgap antennas, and millimetre- and submillimetre-wave components. Dr. de Maagt was co-recipient of the H.A. Wheeler Award of the IEEE Antennas and Propagation Society for the best applications paper of 2001. He was granted a European Space Agency Award for innovation in 2002. He was co-recipient of the LAPC 2006 best paper award. Dr. de Maagt serves as an Associate Editor for the IEEE Transaction on Antennas and Propagation.

Terahertz Technology for Space and Earth Applications

The terahertz (THz) part of the electromagnetic spectrum falls between the lower frequency millimetre wave region and, at higher frequencies, the far-infrared region. The frequency range extends from 0.1 THz to 10 THz, where both these limits are rather loose. As the THz region separates the more established domains of microwaves and optics, a typical THz technique will incorporate aspects of both realms, and may even draw on the best of both. The two bounding parts of the spectrum also yield distinct sets of methods of generating and detecting THz waves. These approaches can thus be categorised as having either microwave or optical/photonic origins. As a result of breakthroughs in technology, the THz region is finally finding applications outside its traditional heartlands of remote sensing and radio astronomy. Extensive research has identified many attractive uses and has paved the technological path towards flexible and accessible THz systems. Examples of novel applications include medical and dental imaging, gene theory, communications and detecting the DNA sequence of virus and bacteria. The presentation will discuss the range of THz applications and will present the components and systems that are utilised for the frequency region.

Electromagnetic Bandgap Materials

Electromagnetic Bandgap Materials are artificially engineered materials exhibiting novel properties. Since their discovery and first demonstration in the late 1980's, interest in EBGs has grown explosively. The potential takeup of these structures in Communications and Sensing Systems is primarily due to the control of the frequencies and wavenumbers of propagating and non-propagating electromagnetic waves to an extent that was not previously possible. Much effort is now being concentrated on the design and manufacture of these different classes of EBG-based components. This presentation will highlight application areas of EBG technology at microwave and (sub) millimetre wave. It sets out with a brief introduction of the concepts. It then discusses some generic configurations and resulting practical applications. Examples of FSS, EBG and AMC generic technology in the microwave region include: patch antennas, cavity antennas, parabolic antennas, metallo-dielectric antennas, waveguides, filters and tunable structures. Examples of applications are array antennas, high precision GPS, mobile telephony, wearable antennas and diplexing antennas. In the submillimetre wave region a 500 GHz dipole configuration is shown and some components.

Werner Wiesbeck

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Werner Wiesbeck (SM 87, F 94) received the Dipl.-Ing. (M.S.E.E.) and the Dr.-Ing. (Ph.D.E.E.) degrees from the Technical University Munich in 1969 and 1972, respectively. From 1972 to 1983 he was with AEG-Telefunken in various positions including that of head of R&D of the Microwave Division in Flensburg and marketing director Receiver and Direction Finder Division, Ulm. During this period he had product responsibility for mm-wave radars, receivers, direction finders and electronic warfare systems. Since 1983 he has been Director of the Institut für Höchstfrequenztechnik und Elektronik (IHE) at the University of Karlsruhe (TH), where he had been Dean of the Faculty of Electrical Engineering. Research topics include radar, remote sensing, wireless communication and antennas. In 1989 and 1994, respectively, he spent a six months sabbatical at the Jet Propulsion Laboratory, Pasadena. He is a member of the IEEE GRS-S AdCom (1992 - 2000), Chairman of the GRS-S Awards Committee (1994 – 1998, 2002 -), Executive Vice President IEEE GRS-S (1998 - 1999), President IEEE GRS-S (2000 - 2001), Associate Editor IEEE-AP Transactions (1996-1999), past and present Treasurer of the IEEE German Section (1987-1996, 2003-2007). He has been General Chairman of the ’88 Heinrich Hertz Centennial Symposium, the '93

Conference on Microwaves and Optics (MIOP '93), the Technical Chairman of International mm-Wave and Infrared Conference 2004, Chairman of the German Microwave Conference GeMIC 2006 and he has been a member of the scientific committees and TPCs of many conferences. For the Carl Cranz Series for Scientific Education he serves as a permanent lecturer for radar system engineering, wave propagation and mobile communication network planning. He is a member of an Advisory Committee of the EU - Joint Research Centre (Ispra/Italy), and he is an advisor to the German Research Council (DFG), to the Federal German Ministry for Research (BMBF) and to industry in Germany. He is the recipient of a number of awards, lately the IEEE Millennium Award, the IEEE GRS Distinguished Achievement Award, the Honorary Doctorate (Dr. h.c.) from the University Budapest/Hungary and the Honorary Doctorate (Dr.-Ing. E.h.) from the University Duisburg/Germany. He is a Fellow of IEEE, an Honorary Life Member of IEEE GRS-S, a Member of the Heidelberger Academy of Sciences and a Member of acatech (German Academy of Engineering and Technology).

3D Propagation Modeling and Characteristics for High Speed Mobiles

In existing wireless telecommunication systems a user can choose either a high data rate or a high mobility. For various applications it would be desirable to have both at the same time: the freedom to move with a very high velocity without loosing the high data rate. Systems based on Orthogonal Frequency Division Multiplexing (OFDM) seem to be suitable to satisfy these conditions. However, the high-speed aspect has to be considered more closely. High-speed links between receivers and transmitters cause varying Doppler, delay and angular spread, which may result in inter-carrier in-terference (ICI) and inter-symbol interference (ISI). ICI and ISI are both a challenge and a limiting factor for a wireless communication system.

Applications for high-speed mobile stations are for example on planes, fast cars, high-speed trains and so on. Several scenarios are chosen for the simulations and partly verified by measurements. For cars these are urban and a high way scenarios, for trains high speed tracks with buildings or forest environment are chosen. For the wave propagation a 3D ray-tracing tool, based on the theory of geometrical optics (GO) and the Uniform Theory of Diffraction (UTD), is used. The model includes modified Fresnel reflection coefficients for the reflection and the diffraction based on the UTD. The propagation channels are characterized by delay spread, Doppler spread and angular spread for different situations. These statistical parameters are compared to measurements. Dynamic simulations will be illustrated by movies. The traffic scenarios are real world with multiple lanes, line of sight and non line of sight.

UWB Antennas and Channel Characteristics

Spectrum is presently one of the most valuable goods worldwide as the demand is permanently increasing and it can be traded only locally. Since the United States FCC has opened the spectrum from 3.1 GHz to 10.6 GHz, i.e. a bandwidth of 7.5 GHz, for unlicensed use with up to –41.25 dBm/MHz EIRP, numerous applications in commu-nications and sensor areas are showing up. All these applications have in common that they spread the necessary energy over a wide frequency range in this unlicensed band in order to radiate below the limit. The results are ultra wideband systems. These new devices exhibit especially at the air interface, the antenna, quite surprising behaviors. This talk presents an insight into design, evaluation and measurement procedures for Ultra Wide Band (UWB) antennas as well as into the characteristics of the UWB radio channel as a whole. UWB antenna basics and principles of wideband radiators, transient antenna characterization and UWB antenna quality measures, derived from the antenna impulse response, are topics. EM simulations and measurements of transient antenna properties in frequency domain and in time domain are included. Different antennas, based on different UWB principles, will be presented. Depending on the interest there are: ridged horn antenna, Vivaldi antenna, logarithmic periodic antenna, mono cone antenna, spiral antenna, aperture coupled bowtie antennas, multimode antennas, sinus antenna and impulse radiating antennas. The channel characterization comprises ray-tracing tools for deterministic indoor UWB channel modeling and measurements. The advantages and drawbacks of the UWB transmission will be discussed, depending on interest. The radiation from different an-tennas will be demonstrated by movies with a pulse excitation.