

would like to invite you
to a guest lecture of

Prof. Dr. Uwe-Carsten Fiebig

Towards the Future Worldwide Aeronautical Communications System LDACS

when: 28th November at 10:00
where: Technicka 2, Praha 6, room T2:B2-621

Today air traffic management uses a 70 years old technology based on analogue modulation and voice transmission. This technique is installed on all airports and in all aircraft worldwide but has a number of major drawbacks. One of them is its inefficient use of the spectrum: in some years the number of available channels will not fulfil the demand to serve all aircraft as air traffic steadily increases.

The modernization of air traffic management just started and requires new aeronautical communication systems. Today's focus is on the development of a new air-ground link referred to as LDACS: L-band digital aeronautical communications system. In this talk the most promising option for LDACS is presented. This option - LDACS1 - has been developed by DLR and its many partners. It is an OFDM based solution which is designed to operate as inlay system in the L-band. The challenge is to cope with various other radio systems like DME (distance measurement equipment) and JTIDS (joint tactical information distribution system) operating in the same frequency band. The talk gives an overview of the PHY and MAC layer specification of LDACS1 and presents key ideas to reduce mutual interference with LDACS1 signals.

In addition to the communications functionality LDACS1 will also offer a navigation component which can be used for APNT (alternative positioning navigation and timing) for aeronauti-

cal users. APNT is kind of a backup system for GNSS. The navigation component of LDACS1 comes almost for free, i.e. without any need to transmit additional (ranging) signals. Ranging is solely based on the communication signals. Special care has to be taken as the ranging accuracy is very sensitive to multipath. Therefore a flight measurement campaign on the air-ground channel and its influence on ranging performance has been carried out. The results reveal that a ranging accuracy in the order of meters can be achieved, thus, fulfilling the APNT requirements.



Prof. Dr. Uwe-Carsten Fiebig was born in Augsburg, Germany, in 1962. He studied electrical engineering at the Technical University of Munich (TUM), Germany, and spent the last year of his studies at Ecole Supérieure en Electrotechnique et Electronique in Paris, France. In 1987 he received the Dipl.-Ing. degree from TUM and in 1993 the Dr.-Ing. degree from University of Kaiserslautern. He joined the Institute of Communications and Navigation, DLR (German Aerospace Research), Oberpfaffenhofen, Germany, in 1988. In 1995 and 1996, he was a Guest Scientist at the Communications Research Center, Ottawa, Canada, and at the Yokohama National University, Japan, respectively. Since 1994, he has been the Head of the Department Communications Systems which carries out research in navigation, aeronautical communications and vehicular communications. His current research interests include channel modeling for satellite communication and navigation as well as for terrestrial and aeronautical communications. He is an Honorary Professor at the University of Ulm, Germany, and teaches satellite communications and navigation.