P06: University of Duisburg and Essen - UDE (Germany)

Description of expertise & activities

The center for semiconductor technology and optoelectronics, ZHO, University of Duisburg-Essen, is working on electronic and optoelectronic components, modules and sub-systems used either in optical communications (including fiber-optic and fiber-wireless access), biophotonic human microsystem implants or sensing applications. The key competence covers electronic HBT, RTD and monolithically integrated analog and digital ICs as well as optoelectronic EAM, EML, PD and OEICs and subsystems based thereon. The ZHO is located in a recently finished building with a 600 square meter clean room. It is equipped with the required technological facilities for the fabrication and packaging of components and integrated circuits based upon III/V semiconductors. Facilities available at the Institute are epitaxy (MBE and MOVPE); material analysis (photoluminescence, x-ray diffraction, ellipsometry, AFM, Hall and C-V characterization); a fully equipped processing line for fabrication of analog and digital ICs and OEICs (e-beam-litho, RIE, ECR-CVD, contact evaporation systems, RTA, etc.); extensive measurements equipment and system demonstrator facilities including electrical and optical NWA, noise characterization, TDM & WDM fiber-optical links, BER measurements, radio-over-fiber demonstrator.

Tasks within BONE

WP13	UDE with the Department of Optoelectronics has experience in optical networks for FTTH and the residential gateway for “Triple-Play” applications. A multi-port transceiver for FTTH “Triple Play” applications has recently been developed A corresponding patent has been filed.
WP16	The team of the Department of Optoelectronics at UDE has expertise in the design and characterisation of broadband fibre (glass and polymer) and wireless (GHz) links, including particularly radio-over-fiber (RoF), radio-over POF (RoPOF) and UWB techniques. As partner of the EU-STREP “POF-ALL” UDE focuses on short-reach plastic optical fiber networks especially in combination with RoPOF applications. UDE will provide market research related to POF in-home, in-building and other short-reach networks. UDE closely cooperates with the In-Haus I and II of FhG-IMS in the framework of intelligent homes, e.g. for health care,, small offices, etc.
WP23	The interest of UDE is radio over fiber technology with the focus on plastic optical and othe MM fiber, e.g. for on-train and on-vehicle communication systems. Frequency bands of 5 GHz and 60 GHz, including UWB techniques will be investigated.

Key personnel

Dieter Jäger received the Diplomphysiker, Dr.rer.nat., and Habilitation degrees in physics, all from the University of Münster, Germany, in 1969, 1974 and 1980, respectively. From 1974 to 1990 he was Head of a research group at the Institute for Applied Physics, University of Münster, where he became an Associate Professor of Physics in 1985. In 1989/90 he was Visiting Professor at the University of Duisburg. Since 1990 he has been with the Faculty of Electrical Engineering of the University of Duisburg where he is Head of the Department of Optoelectronics. He has been Dean of the faculty from 1998 to 2001. He has published more than 300 papers in books, journals and conference proceedings. Prof. Jäger is Honorary Professor of Brasov University/Romania and Consultant Professor of Huazhong University of Science and Technology, China. He is Fellow of the IEEE and Chair of the German IEEE LEOS Chapter as well as member of the IEEE Microwave Photonics Steering Committee. He is consultant of the IEE Photonics Network, member of the Photonics Competence Center and founder of the OpTech-Net, a German Network of Excellence on optical technologies.

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