Press Release

07.07.2021

Leibniz Institute for high performance microelectronics

Terahertz technologies for visionary innovations in communications and sensor technology

The new joint project T-KOS of the Research Fab Microelectronics Germany

Frankfurt (Oder). The T-KOS project, which was launched as part of the Research Fab Microelectronics Germany, has set itself the task of making Terahertz technology synergistically accessible for the industry for the first time in the areas of communication and sensor technology. The application of the innovative system solutions in both areas should lead to the successful implementation of future social topics such as digitalization, Industry 4.0 or resource efficiency and thus continuously strengthen Germany as a business location.

The use of Terahertz technologies provides a promising opportunity for increasing data capacity and usable bandwidth, which is requested due to the growing data volumes in mobile networks as well as the demands on communication networks themselves. Furthermore, this technology can be innovatively applied in the field of non-destructive testing (NDT). The Terahertz waves can penetrate most of electrically non-conductive materials, such as ceramics or plastics, analogous to ultrasound and X-rays. However, they work without a coupling medium, do not require complex mechanical guidance or radiation protection measures and do not cause any danger to the human organism.

Since May 1st 2021, a total of nine cooperation partners of the Research Fab Microelectronics Germany (FMD): the Fraunhofer Institutes ENAS, HHI, FHR, IAF, IMS, IPMS and IZM as well as the Leibniz Institutes FBH and IHP (Leibniz Institute for high performance microelectronics) have been working together with the Fraunhofer ITWM on the project. The aim is to synergistically develop Terahertz technology for wireless radio transmission, non-destructive monitoring technology, spectroscopy and non-contact inline measurement technology. To this end, the technological competences for communication and sensor technology distributed in the FMD are combined and expanded by know-how in the field of signal processing.

Within the one-year project period, different demonstrators will be created that address the future fields of high-frequency electronics, Terahertz photonics and wireless, high-bit-rate communication.

"The overall project goals are to establish a German value chain to Terahertz wireless links, e.g. for high-bit-rate communication in industrial production, inline monitoring of production processes with AI-based, real-time imaging processing for resource-efficient production, and first-of-its-kind industrial-grade Terahertz communication and sensor technology by combining scalable electronic and photonic concepts.", says Dr Dirk Nüßler, project leader and deputy director of Fraunhofer FHR.

"The IHP contributes with integrated Terahertz radar circuits for non-destructive testing technology, designed and manufactured employing the latest in-house SiGe-BiCMOS

IHP GmbH • Innovations for High Performance Microelectronics | Leibniz-Institut für innovative Mikroelektronik
Im Technologiepark 25 • 15236 Frankfurt (Oder) • Tel.: +49 335 5625 0 • E-Mail: ihp@ihp-microelectronics.com

Leibniz Association

Press Release

technology. The use of these chips in future production monitoring systems allows a significant cost reduction compared to current approaches and provides an important contribution to Germany's technological sovereignty in this field," says Dr. Gunter Fischer from IHP.

The T-KOS project is funded by the Federal Ministry of Education and Research (BMBF) in the amount of 10 million euros (funding codes 16KIS1404K, 16KIS1405 and 16KIS1406).

Further information: https://www.forschungsfabrik-mikroelektronik.de/de/presse--und-medien/Presse/T-KOS.html

©Fraunhofer Mikroelektronik

Contact:
Katja Werner
Public Relations
IHP GmbH - Innovations for High Performance Microelectronics/
Leibniz-Institut für innovative Mikroelektronik
Fon: +49 (335) 5625 206
E-Mail: werner@ihp-microelectronics.com
Im Technologiepark 25
15236 Frankfurt (Oder)
Website: www.ihp-microelectronics.com

About IHP:
The IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultrahigh frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, security, medical technology, industry 4.0, automotive industry, and aerospace. The IHP employs approximately 350 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25 µm SiGe BiCMOS technologies, located in a 1500 m² DIN EN ISO 14644-1 3 certified clean room.

www.ihp-microelectronics.com