

Dear IEEE MTT-S Members,

IEEE MTT-S Japan Chapter Chair Hiroshi Okazaki  
Kansai Chapter Chair Shoichi Narahashi  
Nagoya Chapter Chair Akio Wakejima

IEEE MTT-S Japan/Kansai/Nagoya Chapters DML Session

IEEE MTT-S Japan/Kansai/Nagoya Chapters is pleased to invite Dr. Vadim Issakov, Distinguished Microwave Lecturer (DML), Braunschweig University of Technology / Infineon, will give a lecture at Tokyo (Tokyo Institute of Technology, Ookayama Campus) on Thursday, March 28, 2024. Dr. Vadim Issakov's research interests include RF and millimeter-wave IC design, analog and mixed-signal circuits, radar and communication systems, biomedical electronics, and millimeter-wave characterization techniques. He is one of the world's prominent researchers in this field.

This is a rare opportunity for you to meet with him, and we look forward to your participation.

Sponsored by: IEEE MTT-S Japan Chapter / IEEE MTT-S Kansai Chapter / IEEE MTT-S Nagoya Chapter

Date/Time: March 28, 2024 / 16:00 - 17:00

Format: Hybrid-style

Venue: 10F Meeting Room, West Bldg. 8E, Tokyo Institute of Technology (Ookayama Campus)

Access for Ookayama Campus: <https://www.titech.ac.jp/english/0/maps>

Ookayama Campus Map: <https://www.titech.ac.jp/english/0/maps/ookayama>

Map for West Bldg.: <https://www.titech.ac.jp/english/0/maps/ookayama/ookayama>

Online: If you wish to attend, please contact IEEE MTT-S Japan Chapter Secretary Shinjo (Shinjo.Shintaro\*\*eb.MitsubishiElectric.co.jp (change \*\* to @)) by Tuesday, March 26.

Admission fee: Free of charge

Lecturer: Dr. Vadim Issakov (Braunschweig University of Technology / Infineon Technologies)

Title: MILLIMETER-WAVE SYSTEM AND CIRCUIT DESIGN FOR HIGHLY-INTEGRATED RADAR TRANSCEIVERS

Abstract: This talk focusses on system and circuit design considerations for highly-integrated radar transceivers in CMOS and SiGe HBT technologies. The speaker will first provide motivation for realization of radar sensors at mm-wave frequencies by showing the possible applications. Then, frequency band allocations for radar at mm-wave frequencies are discussed. Next, speaker will discuss system level consideration in detail and will present step-by-step system design steps for an integrated fast-chirp FMCW radar transceiver, such as level budget calculation, phase noise considerations, PLL linearity, design of the analog baseband. The system considerations will be systematically translated into specifications of circuit blocks (e.g. LNA, mixer, PA, VCO, analog baseband etc.) of the radar transceiver. Additionally, digital modulation techniques such as phase-modulated continuous-wave (PMCW) will be discussed and a systematic comparison with FMCW will be given. Next, technology-dependent considerations and challenges related to critical building blocks are

discussed (e.g. phase noise, noise figure, operating frequency, routing density, digital baseband). Then, the speaker will present several design examples of integrated radar transceivers operating at V-band and D-band and will discuss the circuit architectures. The talk is rounded out by a vision on novel modulation techniques and trends in MIMO radar array realizations.

(Note) Program may be changed without notice.

#### Contact information

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