State Key Laboratory of Terahertz and Millimeter Waves
香港城市大學 City University of Hong Kong

Seminar On

A Breakthrough Passive Architecture For Commercializing In-Band Full-Duplex Wireless

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Date	**:**	**12 December 2025 (Friday)**
Time	**:**	**2:30 pm – 3:30 pm**
Venue	**:**	**Room 6-213, 6/F, Lau Ming Wai Academic Building, City University of Hong Kong**

Abstract

In-band full-duplex (IBFD) wireless systems are a key enabler for 6G and beyond, but commercialization has been hindered by the challenge of mitigating strong transmitter (Tx) self-interference (SI) at the receiver (Rx). We present a novel all-passive IBFD technique that achieves ultra-high isolation with low cost and reduced complexity. The design integrates polarization-division multiplexing (PDM) with ferromagnetic nonreciprocity, enabled by a newly introduced concurrent dual-mode SIW circulator and dual-mode SIW waveguide. A unique passive, tunable secondary SI cancellation (SIC) mechanism further enhances bandwidth performance. Experimental results in the analog domain demonstrate world-record isolation levels of 50 dB, 70 dB, and 80 dB across bandwidths of 340 MHz, 101 MHz, and 33 MHz, respectively, with excellent tuning capability. Real-world IBFD scenarios confirm the technique's effectiveness in suppressing Tx-to-Rx leakage and minimizing modulation error under strong interference, marking a significant step toward practical IBFD deployment.

Biography

Dr. Ke Wu is Industrial Research Chair in Future Wireless Technologies and Professor of Electrical Engineering with Polytechnique Montréal (University of Montreal), where he was the Director of Poly-Grames Research Center and the Founding Director of the Center for Radiofrequency Electronics Research of Quebec. He is the Founding Director of the Institute for Wireless Intelligence (IWI). Dr. Wu had held positions such as the Canada Research Chair in RF and millimeter-wave engineering and the NSERC-Huawei Endowed Chair. He has authored/co-authored over 1500 referred technical papers, and many books/book chapters and filed more than 90 patents. Dr. Wu was the organizer of numerous conferences and events including the General Chair of the 2012 IEEE MTT-S International Microwave Symposium and the General Co-Chair of 2025 IEEE International Symposium on Antennas & Propagation and North American Radio Science Meeting. He was the 2016 President of the IEEE Microwave Theory and Technology Society (MTT-S). He also served as the two-terms inaugural representative of North America in the General Assembly of the European Microwave Association (EuMA). He was the recipient of many awards and prizes. He was an IEEE MTT-S Distinguished Microwave Lecturer. Dr. Wu is a Fellow of the IEEE, the Canadian Academy of Engineering, the Academy of Science of the Royal Society of Canada, and the German National Academy of Science and Engineering (acatech).

***** ALL ARE WELCOME *****

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