



THz Components Made from 2D Materials and Structures

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The wide adoption of terahertz (THz) technology would require high performance and compact THz sources, detectors and various components. The strong capabilities of 2D metamaterials, or metasurfaces, in EM wave manipulation provide a powerful tool for compact and versatile THz component development, while the unique exciton behavior in 2D semiconductors renders a new dimension for the exploration of THz source and detector. In this talk, I will introduce our work on sub-THz detector using AlGaIn/GaN two dimensional electron gas (2DEG) HEMT with nano-antennas for low noise and high temperature operation, active electrical and thermal tuning of THz response including complete suppression of THz reflection from Si surface by an atomic scale flat metasurface produced by CMOS compatible process, and the potential mid to far-IR and THz detection at high responsivity and room temperature using transition metal dichalcogenide heterostructures.

SHORT BIO:

Jinghua Teng is Principal Scientist in the Institute of Materials Research and Engineering (IMRE), Agency for Science, Technology and Research (A*STAR), Singapore. He received his B. Sc. in Physics and M. Sc. in Optics from Nankai University, and Ph.D. degree in Optoelectronics from the National University of Singapore. He has extensive experiences in both academic research and technology development through industry collaboration. He has edited/authored 5 book/book chapters, filed 24 primary patents and published over 210 journal papers. He has been chair/co-chair as well as sitting in the Technical/Program Committee in many international conferences and also given many invited/keynote talks. He is the associate editor of the Journal of Molecular and Engineering Materials published by World Scientific, editor board member of the Journal of Optics published by IOP and the Opto-Electronic Advances published by CAS, IOE. His research interests include nano-optics & photonics, metamaterials & metasurfaces, 2D materials and 2D optoelectronics, THz technology, plasmonics, semiconductor materials and devices.