Terahertz Radiation

Terahertz (THz) radiation has strong penetrability and high bandwidth, which makes it ideal as the key technology for the next generation of non-intrusive imaging scanners and ultra-high bandwidth wireless communications beyond 100 GHz.

Competitive advantage

- Suitable for high-resolution and non-invasive imaging
- Developing an integrated physical planar platform for ultra-high bandwidth short-range THz communications (terrestrial and space including WiFi, vehicular and health monitoring systems)
- Utilising advances in photonics to improve the overall system performance in terms of cost, size, bandwidth and coupling losses

Impact

- Offers an enormous unlicensed bandwidth for high-speed wireless communications with a wide range of applications such as:
- Whisper radio communications over high-attenuation bands, for example, battlefield sensors and on-body health monitors
- Long distance communications over low-attenuation bands for example cellular, vehicular radar and space communication

Successful applications

- First THz flexible and single-mode waveguide with metamaterial cladding
- Planar high bandwidth photonic crystal waveguide-based devices
- Hybrid metal-dielectric meta-devices for ultra-sensitive sensing and beam forming
- THz polarization-maintaining filters for imaging, sensing, and wireless communication
- Anti-stealth THz ultra-wideband radar

Capabilities and facilities

- THz Time Domain Spectroscopy system with imaging facilities
- Numerical modelling software such as Computer Simulation Technology (CST) microwave studio and in-house developed analytical codes
- Access to Australian National Fabrication Facility (ANFF) for fabrication of devices

Our partners

- Protemics GmbH

More Information

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