

Future Challenges in High-frequency Electromagnetic Metrology (RF to Terahertz)

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Abstract

This lecture describes some of the future challenges facing electrical metrology in the coming few years. The lecture focuses on three areas:

- (i) the 'gap' region in the electromagnetic spectrum between electronic and photonic techniques – the so-called “terahertz gap”;
- (ii) multi-physics techniques that are being developed to characterise nonlinear, active, devices used in next-generation telecommunications applications – 5G, etc;
- (iii) high-speed digital electronics where signal speeds are moving into the microwave and millimetre-wave regions.

The lecture is based on an invited lecture that was given at a workshop organised by the Consultative Committee for Electricity and Magnetism (CCEM) of the International Committee for Weights and Measures (CIPM). The workshop was called “Future challenges in electrical metrology”, and took place at the International Bureau of Weights and Measures (BIPM), Paris, in March 2017.