Building a National Measurement Capability for the Millimetre- and Submillimetre-Wave Frequency Ranges

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Abstract

The National Physical Laboratory (NPL) is the UK's National Measurement Institute (NMI). As such, NPL is tasked with developing, maintaining and disseminating the UK's primary national standards of measurement. These standards represent the ultimate in measurement accuracy and are used to provide measurement traceability to the international system of units (SI). Standards and associated measurement capability are developed in areas of relevance to science and technology. As new science and technology is developed, new measurement standards and new measurement capability are needed to underpin and validate the new science and technology.

In recent years, much use has been made of the millimetre- and submillimetre-wave (also known as terahertz) parts of the electromagnetic spectrum. This is for applications in electronics and telecommunications, defense and security, radio astronomy and atmospheric science, and, healthcare and pharmaceuticals. All these applications have driven the need for accurate and reliable measurement capabilities at these frequencies. This talk will review recent developments being made at NPL to establish such measurement capabilities. Some examples of research and development activities will be given that have recently been undertaken as part of the 'TEMMT' European Joint Research Project. ('TEMMT' stands for "Traceability for electrical measurements at millimetre-wave and terahertz frequencies for communications and electronics technologies".) This project involves 19 organizations from around the world and is running from 2019 to 2022.

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