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The THz Spectral Range: a Window of Opportunities

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We are witnessing impressive progress in THz technologies, mostly driven by the promise of brand new application areas and different ways to interact with matter or to transmit information. Such progress is also related to the under-exploitation of a significant part of the electromagnetic spectrum represented by the far-infrared/THz region that borders with microwaves around 300 GHz and with mid-infrared, around 10 THz or even higher frequencies [1,2]. On the other hand, the potential role of novel photonics tools in the THz range is still to be unveiled but many important applications have already shown its importance. Indeed, material transparency/opacity to THz frequencies is different form nearby mid-IR and can provide better resolved information than lower frequency microwaves/RF [3]. Moreover, for transmission of information THz frequencies are the logical continuation of moving to higher and higher frequencies to get carriers able to carry more and more data [4]. In terms of interaction with matter, THz photons are the key to excite the rotational degrees of freedom of a large part of molecules, enabling metrological measurements to unveil new physics or also to control molecules in view of the most demanding applications on the horizon, like ultracold molecules for quantum simulation, sensing or computing [5,6].

`In these really exciting and thrilling times for THz science and technology, it is crucial to invent proper inst`

The Materials and Methods should be described with sufficient details. New methods and protocols should be described in detail while well-established methods can be briefly described and appropriately cited.

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