

Terahertz Metamaterial Devices

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This work gives an overview of photonic crystal technology being developed for THz at Imperial College London and metal mesh filters to create devices working at terahertz frequencies with the aim to develop a THz stress sensor in collaboration with ISCTE-IUL.

High resistivity silicon photonic crystal technology has been used to demonstrate waveguides [1, 2], switches [1], attenuators [2], resonators [3] and bio-sensors [4] working at 0.1 THz with state-of-the-art performance providing the basis for a THz architecture.

The second technology, metal mesh filters, has been shown to work using a low cost electrically thick substrate throughout the THz band [5]. Furthermore, we have theoretically show their use as THz absorbers [6] and as part of THzMEMS to create stress sensors [7].

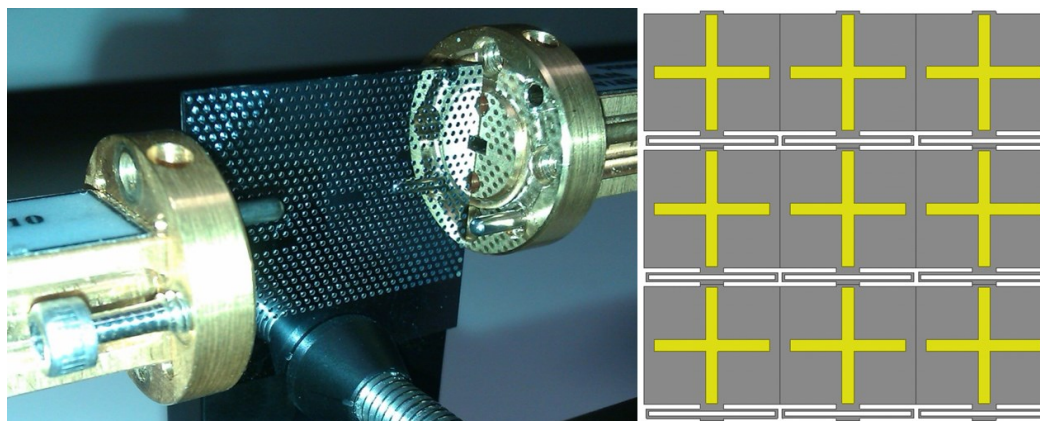


Figure 1: An ultra-high Q-factor 100 GHz photonic crystal resonator (left) and proposed design for THz metal mesh stress sensor (right).

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