

Abstract Submitted
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**High-power sub-mm oscillator based on surface field cavity:
Bridging the THz gap** KEVIN RONALD, University of Strathclyde — Oscillators capable of producing high-power radiation from the mid-GHz to low-THz frequency range will be presented. Such devices are attractive for a range of applications including: active sensing and biochemical spectroscopy. Oscillators capable of producing the required output power at these frequencies are not presently widely available. One of the reasons is the necessity to use high-voltage, high-current density electron beams. An output pulse power of 10kW is sufficient for many applications; compact sources are sought which dictates the use of a relatively low voltage (50kV) electron beam of moderate current. The use artificial materials which have tailored properties optimised for high power operation will be discussed. The use of metamaterials in high power applications meets a number of challenges such as coherence of the radiation scattering from the metamaterial, metamaterial overheating and field enhancement. To overcome some of the challenges an 2D cylindrical surface structure is suggested.

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