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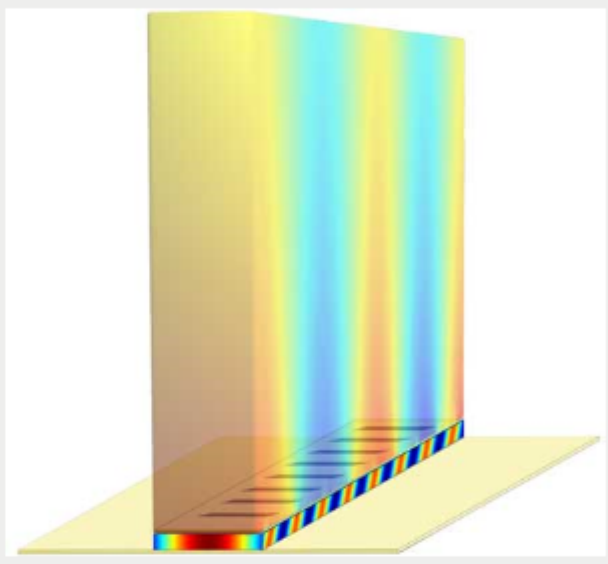
LASERS Tech Pulse

PHOTONICS MEDIA

September 2016

Lasers Tech Pulse is a special edition newsletter from Photonics Media and Bristol Instruments covering key developments in laser technology.

Periodic Photonic Structures Focus Spaser Light for Nanoscale Optics



Single-mode operation in plasmonic lasers has been demonstrated using a technique that implements distributed feedback (DFB) in a novel way that couples the resonant surface plasmon polariton (SPP) mode of the laser to a highly directional far-field radiation pattern and integrates hybrid SPPs in the surrounding medium into the laser's operation. Researchers at Lehigh University have implemented DFB on a terahertz (THz) quantum cascade laser (QCL), a type of plasmonic laser that emits long-wavelength THz radiation.

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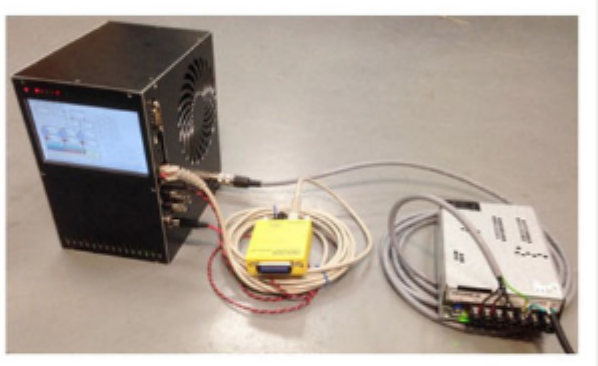
Widely Tunable MIR QCL Eyed for Spectroscopy, Chemical Sensing



A broadband-tunable IR laser has demonstrated the ability to capture the unique spectral fingerprints of gases. The monolithic laser technology is compact, and is expected to have applications in spectroscopy and chemical sensing. The laser only has one moving part — a fan for cooling purposes — which Northwestern University professor Manijeh Razeghi cited as a major advantage over existing systems.

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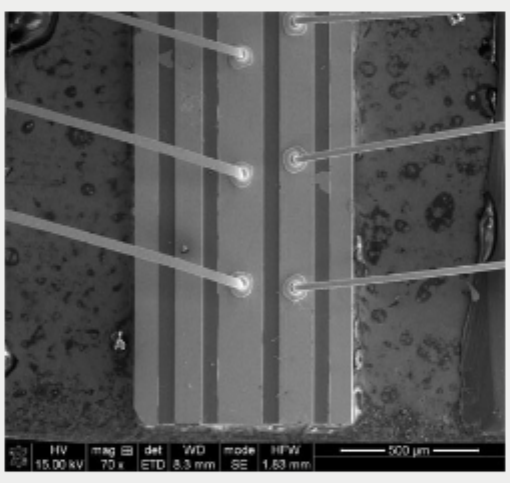
Terahertz QCL Demonstrates Record Power in CW Mode



The output power of a terahertz quantum cascade laser (QCL) has been effectively doubled, producing record output power of up to 230 mW in CW mode, compared to the previous record of 138 mW. A team from the Institute of Applied Physics and Computation Mathematics and the China Academy of Engineering Physics, led by researcher Xuemin Wang, reported the results, and attributed the higher output power to the material growth and manufacturing processes they used.

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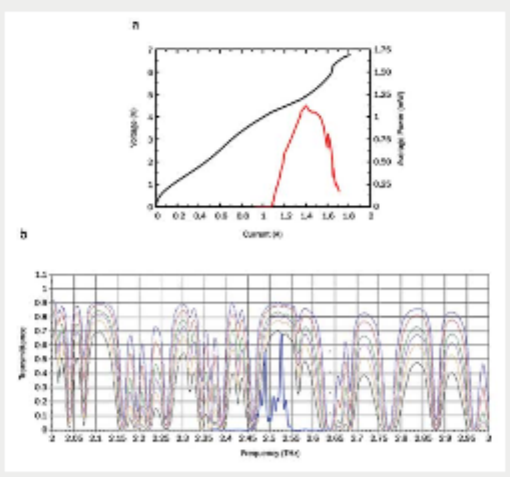
Breakthrough for Real-Time THz Imaging



Terahertz technologies have become a major field of applied research, driven by the tremendous potential of applications such as nondestructive testing, biomedical imaging, security screening and telecommunications. Imaging using THz radiation has garnered increasing attention, as it promises penetrating, contactless and submillimeter diffraction-limited imaging that is suitable for dry, nonpolar, nonmetallic materials such as plastics and ceramics.

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Quantum Cascade Laser Eliminates Need for External Light Source

A novel laser technology, consisting of a quantum cascade laser built on silicon, eliminates the need for an external light source for mid-infrared (MIR) silicon photonic devices or photonic circuits. This advance may have multiple applications that range from chemical bond spectroscopy and gas sensing to astronomy and free-space communications.

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