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Quantum cascade laser based photoacoustic detection of explosives

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Detecting trace explosives and explosive-related compounds has recently become a topic of utmost importance for increasing public security around the world. A wide variety of detection methods and an even wider range of physical chemistry issues are involved in this very challenging area. Optical sensing methods, in particular mid-infrared (MIR) spectrometry techniques have a great potential to become a more desirable tools for the detection of explosives. The small size, simplicity, high output power, wide tunable frequency range and long-term reliability of external cavity quantum cascade lasers (EC-QCLs) are promising spectroscopic sources for developing analytical instrumentation. This work reviews the current technical progress in EC-QCL-based photoacoustic spectroscopy for explosives detection. The potential for both close-contact and standoff configurations using this technique is completely presented over the last six years.

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