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Northwestern tunes mid-infrared QCLs

The ongoing challenges of developing short-wavelength QCLs were described by Neelanjana Bandyopadhyay of Northwestern University in an OPTO session on the topic. "Wavelengths of 3 to 3.5 microns are important for several different spectroscopy applications, because it coincides with many hydrocarbon absorption bands," she said. Of the candidate semiconductor systems, InGaAs-InAlAs on InP is the best choice on balance for

short-wavelength QCLs, according to Northwestern's research. Using it has allowed the development of the first room-temperature continuous wave QCLs in the target wavelength band, although the same system can additionally cover the entire 3-16 micron range under appropriate conditions.

Daylight Solutions has demonstrated a broadly-tunable high-resolution CW laser based on its QC devices. "Broad tuning capability allows the

identification of multiple chemical species in spectroscopy applications, while narrow linewidth facilitates the high spectral resolution that spectroscopy requires," commented Leigh Bromely. The company's external-cavity system, called ECqcl, uses a grating to tune the QCL output and control the tuning performance, and a unique cavity geometry that enforces one mode during operation.

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