

Quantum cascade lasers comb spectrometers

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The quantum cascade laser has demonstrated the ability to provide gain over a very broad wavelength range. Recently, we have shown that such broadband devices, when operated in continuous wave, emit as a coherent optical comb¹.in which the phase relation between the comb modes corresponds approximately to a FM modulated laser. These new comb lasers enables the fabrication of a dual comb spectrometer based on a quantum cascade laser that offers a broadband, all solid-state spectrometer with no moving parts and a ultrafast acquisition time. We discuss recent results in gas spectroscopy as well as the extension of these ideas to the THz.

¹ A. Hugi, G. Villares, S. Blaser, H. C. Liu and J. Faist, “Mid-infrared frequency comb based on a quantum cascade laser”, Nature 492, 229 (2012)..