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Mid-infrared frequency combs based on semiconductor lasers

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Frequency combs are ideal candidates to realize miniaturized spectrometers without moving parts and hence are of great interest for integrated photonics. Here, an overview on the generation electrically pumped optical frequency combs on integrated platforms using semiconductor lasers. This includes self-starting generation of frequency modulated combs in quantum cascade laser in the 8 μ m and interband cascade lasers in the 3-4 μ m wavelength region, respectively. Furthermore, we will discuss how to integrate efficient high-speed modulators in these devices in order to facilitate the generation of picosecond pulses.

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