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标题: Passively mode-locked GaSb-based VECSELs emitting sub-400 fs pulses at 2 mu m
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摘要: We review the development of the first GaSb-based passively mode-locked VECSEL generating sub-picosecond pulses at 2 mu m wavelength range. The general goal of this development was to leverage the unique features of the mode-locked VECSELs (i.e. high-average power, sub-ps operation, high repetition rate, low-noise properties) to the 2-3 mu m wavelengths. Such lasers could have a significant impact on the development of practical ultrafast systems required for frequency-combs, time-resolved molecular spectroscopy, THz generation, or as seeders for optical amplifiers and mid-IR supercontinuum sources. By using semiconductor gain mirrors and saturable absorber mirrors incorporating InGaSb/GaSb quantum wells, we have been able to demonstrate a VECSEL producing near transform-limited 384 fs pulses at a wavelength of 1950 nm. Important part of this development has been focused on understanding the ultrafast absorption recovery dynamics of the SESAM. An interesting observation is that the absorption recovery time of as-grown InGaSb SESAMs is within ps range and is not much affected by a change of the growth parameters.
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