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Title:Comparison of Monolithic Optical Frequency Comb Generators Based on Passively Mode-Locked Lasers for Continuous Wave mm-Wave and Sub-THz Generation
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Abstract:In this paper, two different Passive Mode-Locked Laser Diodes (PMLLD) structures, a Fabry-Perot cavity and a ring cavity laser are characterized and evaluated as monolithic Optical Frequency Comb Generators (OFCG) for CW sub-THz generation. An extensive characterization of the devices under study is carried out based on an automated measurement system that systematically evaluates the dynamic characteristics of the devices, focusing on the figures of merit that define the optimum performance of a pulsed laser source when considered as an OFCG. Sub-THz signals generated with both devices at 60 GHz and 90 GHz are presented and analyzed in terms of electrical linewidth to compare such components for mm-Wave and sub-THz photonic generation. This work offers a systematic comparison of PMLLD devices for OFCG operation and provides reference information of the performance of two different device topologies that can be used for the implementation of photonic integrated sub-THz CW generation.
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Inspec controlled terms:laser cavity resonators - laser mode locking - microwave photonics - millimetre wave generation - ring lasers - semiconductor lasers - submillimetre wave generation
Uncontrolled terms:monolithic optical frequency comb generator - passively mode locked laser - continuous wave millimeter wave generation - subterahertz wave generation - laser diodes structures - Fabry-Perot cavity - ring cavity laser - monolithic Optical Frequency Comb Generator - pulsed laser source - frequency 60 GHz - frequency 90 GHz
Inspec classification codes:A4260F Laser beam modulation, pulsing and switching; mode locking and tuning - A4255P Lasing action in semiconductors - A4260D Laser resonators and cavities - B4330B Laser beam modulation, pulsing and switching; mode locking and tuning - B4320J Semiconductor lasers - B4320L Laser resonators and cavities - B1350P Microwave photonics
Numerical data indexing:frequency 6.0E+10 Hz;frequency 9.0E+10 Hz
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