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Title:Dual-wavelength high-power diode laser system based on an external-cavity tapered amplifier with tunable frequency difference
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Abstract:A dual-wavelength high-power semiconductor laser system based on a tapered amplifier with double-Littrow external cavity is demonstrated around 800 nm. The two wavelengths can be tuned individually, and the frequency difference of the two wavelengths is tunable from 0.5 to 10.0 THz. To our knowledge, this is the broadest tuning range of the frequency difference from a dual-wavelength diode laser system. The spectrum, output power, and beam quality of the diode laser system are characterized. The power stability of each wavelength is measured, and the power fluctuations of the two wavelengths are almost of opposite phase. The simultaneous emission of the two wavelengths is verified by a sum-frequency generation experiment in a bismuth triborate nonlinear crystal.
Number of references:20
Inspec controlled terms:bismuth compounds - laser cavity resonators - laser stability - laser tuning - optical frequency conversion - quantum well lasers - semiconductor optical amplifiers
Uncontrolled terms:dual-wavelength high-power diode laser system - external-cavity tapered amplifier - tunable frequency difference - double-Littrow external cavity - beam quality - diode laser system spectrum - diode laser system output power - power stability - power fluctuations - simultaneous emission - sum-frequency generation experiment - bismuth triborate nonlinear crystal - frequency 0.5 THz to 10.0 THz - BiB_3O_6
Inspec classification codes:A4255P Lasing action in semiconductors - A4260B Design of specific laser systems - A4260D Laser resonators and cavities - A4260F Laser beam modulation, pulsing and switching; mode locking and tuning - A4265K Optical harmonic generation, frequency conversion, parametric oscillation and amplification - B4320J Semiconductor lasers - B4320L Laser resonators and cavities - B4330B Laser beam modulation, pulsing and switching; mode locking and tuning - B4340K Optical harmonic generation, frequency conversion, parametric oscillation and amplification
Numerical data indexing:frequency 5.0E+11 1.0E+13 Hz

Chemical indexing:BiB3O6/ss B3O6/ss O6/ss B3/ss Bi/ss B/ss O/ss
Treatment:Experimental (EXP)
Discipline:Physics (A); Electrical/Electronic engineering (B)
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