48
Accession number:20114414467860
Title:Ultrafast spin-induced polarization oscillations with tunable lifetime in vertical-cavity surface-emitting lasers
Authors:Gerhardt, N.C. (1); Li, M.Y. (1); Jhme, H. (1); Hpfner, H. (1); Ackemann, T. (2); Hofmann, M.R. (1)
Author affiliation:(1) Photonics and Terahertz Technology, Ruhr-University Bochum, D-44780 Bochum, Germany; (2) SUPA and Department of Physics, University of Strathclyde, Glasgow G4 0NG, United Kingdom
Corresponding author:Gerhardt, N.C.(nils.gerhardt@rub.de)
Source title:Applied Physics Letters
Abbreviated source title:Appl Phys Lett
Volume:99
Issue:15
Issue date:October 10, 2011
Publication year:2011
Article number:151107
Language:English
ISSN:00036951
CODEN:APPLAB
Document type:Journal article (JA)
Publisher:American Institute of Physics, 2 Huntington Quadrangle, Suite N101, Melville, NY 11747-4502, United States
Abstract:We report spin-induced polarization oscillations in vertical-cavity surface-emitting lasers above threshold and at room temperature. The oscillation frequency is 11.6 GHz, which is significantly higher than the modulation bandwidth of less than 4 GHz in the device. The oscillation frequency is determined by an additional resonance frequency in birefringence containing microcavities, which is potentially much higher than the conventional relaxation oscillation frequency. The damping of the oscillations can be controlled by the current, allowing for oscillation lifetimes much longer than the spin lifetime in the device as well as for short bursts potentially interesting for information transmission.
Number of references:21