63
Accession number:20115114628873
Title:Broad gain in a bound-to-continuum quantum cascade laser with heterogeneous active region
Authors:Freeman, Joshua R. (1); Brewer, Anthony (1); Madéo, Julien (2); Cavalié, Pierrick (2); Dhillon, Sukhdeep S. (2); Tignon, Jérome (2); Beere, Harvey E. (1); Ritchie, David A. (1)
Author affiliation:(1) Semiconductor Physics, Cavendish Laboratory, University of Cambridge, JJ Thomson Avenue, Cambridge, CB3 0HE, United Kingdom; (2) Laboratoire Pierre Aigrain, Ecole Normale Supérieure, Universite D. Diderot, 75231 Paris Cedex 05, France
Corresponding author:Freeman, J.R.(joshua.r.freeman@gmail.com)
Source title:Applied Physics Letters
Abbreviated source title:Appl Phys Lett
Volume:99
Issue:24
Issue date:December 12, 2011
Publication year:2011
Article number:241108
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 demonstrate the operation of heterogeneous terahertz quantum cascade lasers with broadened gain by optimising the sub-stacks to align at the same field. In single plasmon waveguides, we find two-colour operation for nearly the entire dynamic range of the lasers with similar performance to homogeneous lasers. Time domain spectroscopy measurements confirm that a flat gain spectrum is present and the sub-stacks align at the same time. When incorporated into metal-metal waveguides, we find that performance is consistent with the constituent sub-stacks and there is broadband operation over 380 GHz.
Number of references:13