53
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Title:A dual-mode quantum dot laser operating in the excited state
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Abstract:A dual-mode laser operating in the excited states (ESs) of a quantum dot is realized by combining asymmetric pumping and external optical feedback stabilization. In generating two single-mode emission peaks, a mode separation ranging from 1.3-THz to 3.6-THz is demonstrated over temperature. This effect is attributed to the unique carrier dynamics of the quantum-dot gain medium via the excited state inhomogeneous linewidth coupled with a proper external control. These results are particularly important towards the development of future THz optoelectronic sources with compact size, low fabrication cost, and high performance.
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