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Title:Temperature dependence of the threshold current density of a GaN based quantum dot laser
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Abstract:With considering a simple and almost exact models, a III-nitride based spherical quantum dot cascade laser has been analyzed, where the generation of the terahertz waves are obtained. With self-consistent solution of the Schro¨dinger, Poisson, and the laser rate equations, including all effects such as piezoelectric and spontaneous polarization in nitride-based QDs and the effects of the temperature, the exact value of the lasing frequency and also the other parameters such as the energy levels, the wavefunctions, and the lifetimes of subbands are calculated. Also the laser parameters such as the optical gain, the output power and the threshold current density have been calculated at difference temperatures.