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Abstract:A terahertz quantum cascade laser (THz QCL) architecture is presented in which only the ground state subbands of each quantum well are involved in the transport and lasing transition. Compared to state-of-the art THz QCLs based on the resonant-phonon scheme, ground state QCLs employ narrower wells so that all high-energy subbands are pushed up far above the occupied subband levels, significantly reducing parasitic interactions. Data on the experimental realization of two types of ground state QCLs are presented, in which the result of lasing above 5 THz is demonstrated. © 2012 American Institute of Physics.
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