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Title
Evolution of Highly Confined Surface Plasmon Modes in Terahertz Quantum Cascade Laser Waveguides
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Abstract
The evolution of surface plasmon (SP) supermodes through the effective coupling of isolated SP modes in a semiinsulating quantum cascade laser (QCL) waveguide is thoroughly discussed here. The effect of varying the material and geometric parameters of GaSb/AlGaSb QCL operating at 3.0 THz are thoroughly studied using a full-vectorial finite-element method. It was observed that this structure is prone to mode degeneration caused by resonant interaction of the lasing mode with a higher order plasmon mode. An optimized design is also proposed to suppress such adverse affects and highly divergent field profiles arising from the generation of higher order lateral modes. (20 References).