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Title:Terahertz oscillators using electron devices - an approach with Resonant tunneling diodes
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Abstract:Resonant tunneling diodes (RTDs) have the potential for compact and coherent terahertz (THz) sources operating at room temperature. In this paper, recent results of THz oscillators with RTDs are described. A fundamental oscillation frequency up to 831 GHz was achieved with RTD having high available current density and low capacitance. By the structure reducing the transit time, the frequency further increased to 1.04THz. This is the first achievement of a fundamental oscillation above 1 THz in room-temperature electronic single oscillators. The output power of 400 μW at 550 GHz was obtained in a single oscillator by the offset-fed slot antenna. Coherent power combining with multi-element array was observed. The spectral linewidth, frequency change with bias voltage, and direct modulation were also described.
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