490
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Title:Terahertz Generation Using Implanted InGaAs Photomixers and Multi-wavelength Quantum Dot Lasers
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Abstract: We report on a study of terahertz (THz) generation using implanted InGaAs photomixers and multi-wavelength quantum dot lasers. We carry out InGaAs materials growth, optical characterization, device design and fabrication, and photomixing experiments. This approach is capable of generating a comb of electromagnetic radiation from microwave to terahertz. For shortening photomixer carrier lifetime, we employ proton implantation into an epitaxial layer of lattice matched InGaAs grown on InP. Under a 1.55 mu m multimode InGaAs/InGaAsP quantum dot laser excitation, a frequency comb with a constant frequency spacing of 50 GHz generated on the photomixer is measured, which corresponds to the beats of the laser longitudinal modes. The measurement is performed with a Fourier transform infrared spectrometer. This approach affords a convenient method to achieve a broadband multi-peak coherent THz source.
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