392. Title:Photoconductive emitters advance ultrafast terahertz sources
Authors:Wahlstrand, Jared (1); Dekorsy, Thomas (2); Klatt, Gregor (3); Cundiff, Steven (4)
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Abstract:The latest developments in high-repetition-rate femtosecond sources of terahertz radiation show significant improvements in efficiency, suggesting that photoconductive emitters will continue to remain important terahertz sources. High-repetition-rate ferntosecond sources are simpler, cheaper, and less noisy than those that are based on amplified laser systems. A specially designed photoconductive terahertz emitter overcomes the problems associated with conventional terahertz radiation sources by using a metal-semiconductor-metal (MSM) interdigitated finger structure processed by optical or electron beam lithography. The latest developments have resulted in the realization of a new concept for terahertz emitters based on the lateral photo-Dember effect. The photo-Dember emitter is prepared on an epitaxial layer of In 0.53Ga0.47As grown on an indium phosphide (InP) substrate. These can be also used along with a compact erbium-doped femtosecond fiber laser due to the smaller band-gap energy of InGaAs.