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标题: The scheme of Efficient Terahertz Difference Frequency Generation in two-dimensional periodical Crystals by CO2 laser
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摘要: This paper reports the scheme of terahertz (THz) wave generation on the basis of difference frequency generation in two-dimensional periodically structural Crystals pumped by CO2 laser. The two orthogonal periodic structures individually compensate for both the phase mismatch of the launched lasers and the generated THz wave. Quasi phase matching (QPM) was designed to satisfy the wave vector phase matching condition in two-dimensional periodical GaAs crystals. The parallel to the direction of the pump wave propagation grating period Lambda(1) and perpendicular to the direction of the pump wave propagation grating period Lambda(2) of two-dimensional periodical GaAs crystals at the 100-1000 mu m (0.3-3THz) range are investigated. The length of the parallel to the direction of the pump wave propagation grating period is 90.17 mu m and the length of the perpendicular to the direction of the pump wave propagation grating period is 83.69 mu m in the two-dimensional collinear QPM scheme to generate a frequency of 1 THz wave pumped by CO2 laser. The result shown that the scheme of phase matching applies two-dimensional collinear quasi phase matching (QPM) is efficient to obtain high power conversion efficiency of THz wave.
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