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Title:Wide Frequency Tunable GaSe Terahertz Emitter under Collinear Phase Matching Condition
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Abstract:1.2μm - laser pumped wide frequency tunable coherent terahertz (THz) light source is demonstrated. The operation principle is based on difference frequency generation (DFG) with an excitation of phonon - polariton in Gallium Selenide (GaSe) crystal. The pump and signal lasers used are 1.2μm Cr:Forsterite lasers. The tuning range of the THz wave frequency covers from 0.3THz to 4.8THz (type eoo phase matching) and 8.3THz to 10.2THz (type eoo phase matching) under collinear phase matching conditions. It is shown that the maximum conversion efficiency is up to ~10^{-6}, which is 3 orders in magnitude larger than that of Gallium Phosphide (GaP) crystal.
Number of references:7
Inspec controlled terms:gallium compounds - optical frequency conversion - optical phase matching - optical pumping - phonons - polaritons - solid lasers - terahertz wave generation
Uncontrolled terms:wide frequency tunable terahertz emitter - collinear phase matching condition - wide frequency tunable coherent terahertz light source - operation principle - difference frequency generation - phonon-polariton excitation - gallium selenide crystal - pump lasers - signal lasers - Cr:Forsterite lasers - tuning range - gallium phosphide crystal - wavelength 1.2 mum - frequency 0.3 THz to 4.8 THz - frequency 8.3 THz to 10.2 THz - GaSe
Inspec classification codes:A4265K Optical harmonic generation, frequency conversion, parametric oscillation and amplification - A7136 Polaritons - A7320M Collective excitations (surface states) - A4255R Lasing action in other solids - B4340K Optical harmonic generation, frequency conversion, parametric oscillation and amplification - B4320G Solid lasers
Numerical data indexing:wavelength 1.2E-06 m;frequency 3.0E+11 4.8E+12 Hz;frequency 8.3E+12 1.02E+13 Hz
Chemical indexing:GaSe/int Ga/int Se/int GaSe/bin Ga/bin Se/bin
Treatment:Experimental (EXP)
Discipline:Physics (A); Electrical/Electronic engineering (B)
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