Abstract Submitted
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Velocity-matching dispersion maps for zincblende and chalcopyrite terahertz sources JOSEPH ROWLEY, West Virginia University, KEVIN ZAWILSKI, PETER SCHUNEMANN, BAE Systems, DEREK BAS, ALAN BRISTOW, West Virginia University — Pulsed terahertz radiation has been shown to be a useful diagnostic in fundamental and applied science. A common method for generating pulsed THz is by optical rectification. (110)-cut $ZnGeP_2$ was previously demonstrated as an efficient source of broadband THz radiation for near-infrared pump pulses [1], while other orientations have been modeled to show equal or greater efficiency [2]. Here we explore and compare phase-matching in $ZnGeP_2$ to that in other commonly used near-infrared THz sources including GaAs and GaP. We experimentally demonstrate that the three most efficient orientations provide distinct phase-matching configurations and thus distinct phase-matched near-infrared and THz frequencies. Our calculations also show that thin ($\sim$100 micron) crystals of ZGP may be promising sources for phase-matched and broadband THz emission out to 9 THz for 850 nm pump pulses.

[1] J. D. Rowley, J. K. Pierce, A. T. Brant, L. E. Halliburton, N. C. Giles, P. G. Schunemann, A. D. Bristow, Opt. Lett. 37, 788 (2012)
[2] J. D. Rowley, J. K. Wahlstrand, K. T. Zawailski, P. G. Schunemann, N. C. Giles, A. D. Bristow, Opt. Express 20, 16968 (2012)

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