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Title:Choice of optimal crystal-orientation for terahertz transceiver with zincblende crystal

Authors:Tian, Xiao-Guang (1); Ling, Fu-Ri (1); He, Jian (1); Liu, Jin-Song (1); Yao, Jian-Quan (1)

Author affiliation:(1) Wuhan National Laboratory for Optoelectronics, School of Optoelectronic Science and Engineering, Huazhong University of Science and Technology, Wuhan 430074, China; (2) College of Precision Instrument and Optoelectronics Engineering, Tianjin University, Tianjin 300072, China

Corresponding author:Ling, F.-R.(lingfuri@163.com)

Abstract:This paper presents a set of equations describing the terahertz generation and electro - optic detection based on optical rectification in zincblende crystals. The dependence of terahertz emission efficiency on the polarization of incident beam and crystal-orientation is discussed. For the experimental setup with a transceiver which transmits and detects terahertz radiation in the same crystal, we have demonstrated the optimal combination of both parameters above to optimize the working efficiency. Equations supplied in this paper are valid for zincblende crystals with arbitrary crystal-orientation and every possible polarization of an incident beam, which are of great significance for the optimization of a system.