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Title:Diffraction properties of terahertz zone plates with Gaussian beam incidence

Authors:Zhao, Yang (1); Li, Dehua (1); Zhou, Wei (1); Ma, Jianjun (1); Yao, Xiangjun (1); Tian, Youliang (1)

Author affiliation:(1) Qingdao Key Laboratory of Terahertz Technology, Terahertz Research Center, Shandong University of Science and Technology, Qingdao 266510, China

Corresponding author:Li, D.(jcbwl@sdust.edu.cn)

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Abstract:Diffraction properties of the continuous phase type zone plate with Gaussian beam incidence were analyzed based on Rayleigh-Sommerfeld diffraction theory. The simulations of intensity distribution on the focal plane and the optic axis were completed using Matlab. Diffraction fields of the zone plate with continuous phase were analyzed. The effects of the parameters of the incident beam on the diffraction field were discussed. The results indicate that the continuous phase type zone plate can focus Gaussian beam with high diffraction efficiency. Diffraction law of the continuous phase type zone plate is similar to that of thin lens. If the waist location is optimized, the diffraction efficiency will be larger than 85%. Compared with the plane wave incidence, when the Gaussian beam is incident, the center electric magnitude is smaller, but the diffraction efficiency is higher.

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