Abstracts

Millimeter-Wave Diffraction by a Photo-Induced Plasma Grating

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Optical gratings are used extensively for beamsteering in the visible and IR range of the spectrum. Change in the dielectric permittivity of a semiconductor medium resulting from the excitation of a nonequilibrium electron-hole plasma makes it possible to extend this technique to MMW frequencies. A photo-induced plasma grating (PIPG) can be easily rewritten by changing the illumination pattern, so this technique can be used in an optically controllable MMW antennas. Initial experimental work studied the diffraction of MMW propagating along a dielectric waveguide containing a PIPG. This paper reports on the diffraction of MMW propagating in free space, steered by the PIPG.

❑ Return to main document.