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Title:The grooved-dielectric Fresnel zone plate: an effective terahertz lens and antenna

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Abstract:A number of microwave and terahertz grooved-dielectric Fresnel zone plate (FZP) and ordinary lenses and antennas are studied and compared numerically. Although the microwave (38 GHz) eight-step FZP lens is certainly inferior, the corresponding terahertz (1.5 THz) FZP lens is comparable in focusing action to the ordinary one. By use of a new design approach to the terahertz FZP lens/antenna the typical unwanted focusing shift from the design frequency is removed and even better focusing performance is obtained within a limited frequency band. Thus, at terahertz frequencies the dielectric FZP lens or antenna is a lightweight and an effective option to the ordinary lens or antenna. © 2012 Wiley Periodicals, Inc.

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Inspec controlled terms:dielectric devices - Fresnel diffraction - lens antennas - terahertz wave devices

Uncontrolled terms:grooved-dielectric Fresnel zone plate - terahertz lens - terahertz antenna - eight-step FZP lens - unwanted focusing shift - frequency 38 GHz

Inspec classification codes:B5270B Single antennas

Numerical data indexing:frequency 3.8E+10 Hz

Treatment:Practical (PRA); Theoretical or Mathematical (THR)

Discipline:Electrical/Electronic engineering (B)

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