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Title:A Bifocal ellipsoidal Gregorian reflector system for THz imaging applications

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Abstract:Current terahertz imagers rely on reflector systems for the beam quality and imaging speed because the cross-range span that the system can cover is limited by the beam aberrations when the antenna scans. We present the design of a Bifocal reflector system that can rapidly scan a terahertz beam for standoff imaging applications while increasing the field of view of previous designs up to 50%. The design is based in a confocal Gregorian system where the nominal reflector surfaces are substituted by shaped surfaces to reduce the beam aberrations, while not increasing the manufacture cost of the reflector antenna. We also provide a set of useful design formulas for the design of this kind of reflector systems. The beam patterns obtained by the proposed designs are numerically calculated with the commercial software GRASP and compared with those obtained with previous approaches to the same problem, showing the better performance of the proposed solution. © 1963-2012 IEEE.

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