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Title:Influence of Gaussian beam on conductor cylinder terahertz radar cross section

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Abstract:By measuring radar cross section (RCS) of scale model, the RCS of the full size target at microwave band is acquired. The estimation and measurement of the terahertz radar cross section is one of the most important applications in terahertz technique. In the RCS estimation, usually a plane wave is assumed; while in real measurement, generally a Gaussian beam or a similar beam resource is adopted. The RCS of an infinite perfect conductor cylinder is estimated under the condition that the incident wave is transverse electric wave. In the estimation, the influence of 2.52 THz collimated laser beam and phase variation on backward RCS are studied and the RCS with scattering angle is obtained; at the same time, a comparison between plane wave and Gaussian beam is also given. The estimation results show choosing facula radius 30 mm is appropriate when cylinder radius is 10 mm and the distance between the cylinder and the beam source is 1 m.

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Controlled terms:Elastic waves - Electromagnetic waves - Estimation - Gaussian beams - Radar cross section

Uncontrolled terms:A-plane - Beam sources - Collimated laser beams - Conductor cylinder - Estimation results - Incident waves - Microwave bands - Perfect conductor - Phase variation - Plane wave - Real measurements - Scale models - Scattering angles - Terahertz technique - Transverse electric waves

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