Abstracts

Microwave Diversity Imaging of Perfectly Conducting Objects in the Near-Field Region

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In this paper, analytical and numerical studies of microwave diversity imaging of continuous and discrete conducting objects in the near-field region are presented. Analytical results show that the image of the scattering object can be reconstructed via Fourier inversion of the data acquired from the recorded scattered field using angular and frequency diversity techniques. Furthermore, different feature information of the scattering object can be obtained using a polarization diversity technique. Various scattering arrangements are studied and compared on the basis of the reconstructed image quality and practical considerations. Numerical results show that the described frequency, angular, and polarization diversity techniques in the backward scattering arrangement can be a cost-effective approach in near-field microwave imaging systems.

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