

# Method for rapidly calculating the diffraction of electromagnetic waves by cylindrical dielectric objects

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## Abstract

The paper considers an iterative algorithm for solving the Fredholm integral equation of the second kind based on the application of the fast Fourier transform algorithm for the convolution integral calculation. The algorithm is applied to the analysis of diffraction of an electromagnetic wave with TE-polarization (for example, a non-paraxial Gaussian beam) by cylindrical dielectric micro-objects with the transverse size comparable to the wavelength. The results of numerical simulation and the results of its comparison with an analytical calculation are presented.

**Keywords:** diffraction electromagnetic wave, dielectric object, Fredholm integral equation, Fourier transform, integral calculation, TE-polarization, Gaussian beam.

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