Diffraction of a plane wave of a finite radius on a spiral axicon and a spiral phase plate: comparison

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Abstract

Analytical expressions were obtained that describe the Fraunhofer diffraction of a plane wave of a finite radius on a spiral axicon (SA) and a spiral phase plate (SPP). The solutions are obtained in the form of a series of Bessel functions for SA and as a finite sum of the Bessel functions for SPT. Moreover, the solution for SA turns into the solution for SPP if the axicon parameter is set to zero. Numerical examples show that the addition of a "weak" axicon to a SPP leads to a decrease in the contrast of concentric rings in the diffraction pattern.

Keywords: Spiral Axicon, Spiral Phase Plate, Fraunhofer diffraction, Bessel functions.

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Access full text (in Russian)

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