Design and investigation of color separation diffraction gratings

L.L. Doskolovich[1,2], E.V. Tyavin[1], N.L. Kazanskiy[1,2], O.I. Petrova[3]
[1]Samara State Aerospace University (SSAU)
[2]Image Processing Systems Institute of RAS
[3]Togliatti State University

Abstract:

The work of color separation diffraction gratings in the framework of rigorous electromagnetic theory is investigated. The intensities of diffraction orders are calculated depending on the magnitude of the period. The limits of applicability of the scalar approximation and the approximation of geometric optics used in the calculation of microrelief of optical elements of this type are estimated. The design of color separation gratings is developed in the framework of a rigorous theory using the gradient method. The degree of optimality of the solutions obtained in the framework of the scalar theory is estimated.

Keywords: diffraction gratings, electromagnetic theory, scalar approximation,approximation geometric optics, color separation grating

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