

Designing binary diffraction gratings with etching wedge

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Abstract:

The work of binary diffraction gratings in the presence of an etching wedge is investigated. The intensities of diffraction orders are calculated depending on the size and type of the etching wedge. The diffraction microrelief is optimized taking into account the etching wedge.

Keywords: binary diffraction gratings, diffraction microrelief, etching wedge.

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References:

- [1] Soifer VA, ed. *Methods for computer design of diffractive optical elements*. New York: John Willey and Sons Inc; 2002. ISBN: 978-0-471-09533-0.
- [2] Soifer V, Kotlyar V, Doskolovich L. *Iterative methods for diffractive optical elements computation*. Taylor and Francis LTD; 1997. ISBN: 0-7484-0634-4.
- [3] Seldowitz MA, Allebach JP, Sweeney DW. Synthesis of digital holograms by direct binary search. *Appl Opt* 1987; 26(14): 2788-2798. DOI: 10.1364/AO.26.002788.
- [4] Turunen J, Vasara A, Westerholm J. Kinofom phase relief synthesis: A stochastic method. *Opt Eng* 1989; 28(11): 1162-1167. DOI: 10.1117/12.7977113.
- [5] Turunen J, Vasara A, Westerholm J. Stripe-geometry for two-dimensional Dammann gratings. *Opt. Commun.* 1990; 74(3-4): 245-252. DOI: 10.1016/0030-4018(89)90358-1.
- [6] Mait JN. Design of binary-phase and multiphase Fourier gratings for array generation. *J Opt Soc Am A* 1990; 7(8): 1514-1528. DOI: 10.1364/JOSAA.7.001514.
- [7] Zhou G, Chen Y, Wang Z, Song H. Genetic local search algorithm for optimization design of diffractive optical elements. *Appl Opt* 1999; 38(20): 4281-4290. DOI: 10.1364/AO.38.004281.