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Computer simulation of modulated two-beam interference using monochromatic light

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Keywords

apodized apertures, amplitude modulation, two-beam interference, Abel transform

Abstract

Two different models are suggested to describe the fringe shift obtained from the two beam interference modulated by the phase variations of transparent objects. The first model of the fringe shift assumes a linear triangular distribution, while the second model varies as a truncated Gauss function. The Abel transform enables computation of the refractive index distribution from the theoretical data of the fringe shift. The fringe shift of the phase object is represented in the harmonic term of the intensity distribution formula. A computer program is written to plot both of the fringe shifts of the models described and the corresponding refractive indices of the phase object. Comparative results are cited in the introduction which are based on an algebraic reconstruction technique (ART) using two models; one of them has a cosine phantom field which constructs an asymmetric single peak, while the other model has cosGauss function giving an asymmetric double-peak phantom. These results are compared with our results, which gives only a single peak in both cases of linear and quadratic variations, which is convenient for use in optical fibers.



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