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Correction for distortions in holographic nanointerferometers

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Abstract content
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Fast progress in matrix liquid-crystal phase modulators, in particular those of Holoeye production, made it possible to realize some interesting schemes in holography, and, in particular, in holographic interferometery for investigation of nano-sized objects. Combination of analogous and digital processing made it possible, in particular, to provide the real-time magnification of holograms and real-time digital variation of spatial frequency of interferogram. However, when considering the nano-size objects, even in a high optical quality interferometer one has to keep in mind the residual distortions of the interfering wavefronts, imposed by residual defects and deformations of the interferometer elements. One can eliminate these distortions by combining in one and the same scheme of the real-time holographic magnification of interferogram and of the dynamic holographic correction for distortions. We discuss the results of theoretical evaluation of such a combined interferometer performance and of its experimental simulation.

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