

Theorem 1 Birkhoff curve contains the only fixed point.

K. Kuratowski (1928) proved that an indecomposable continuum cutting a plane into two regions turns out to be monostratic (monostratique) [1]. Therefore, the Birkhoff curve has the only fixed point with an index being equal to zero. It is simple. So that, the Birkhoff curve is consisted to be nonwandering indecomposable continuum turning out to be two invariant regions boundary with respect to dynamic system acting on the plane. The Birkhoff curve geometric model has been constructed based on the Knaster example indecomposable continuum having two composants [2]. Endpoints (0,0) and (0,1) of the Knaster's continuum are glued by the formula $(y - 7/20)e^{2\pi x} \mapsto x + iy$.

Now, on the assumption of the principle of constructing the Birkhoff curve geometric model, geometric models of the nonwandering continua turning out to be three regions common boundary have been constructed. The continua turn out to be three regions common boundary. Moreover, these constructions turn out to be more adapted to dynamic systems.

[1] Kuratowski, C. *Sur la structure de fronti'eres communes 'a deux r'egions*. Fund. Math., **12** (1), 21-42 (1928)

[2] Knaster B. *Un continu dont tout sous-continu est ind'ecomposable*, Fund. Math. **3**, 247-286 (1922).

[3] Serow, D.,W. *Nonwandering Continuum Possessing the Wada Property*. Theor. and Math. Phys., **207**, 3, 841-853 (2021).

Dynamic holography for light fields transformation and materials diagnostics of advanced photonics and electronics

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The report presents a review of the theoretical and experimental studies in the field of dynamic holography, its history and the development stages are considered, new trends in its applications in science and engineering are indicated with the use of the obtained results. The classical holography aspects are treated along with the nonlinear-optical approach based on multiwave interaction schemes in the case when the third-order and higher-order nonlinearities are involved. Special attention is given to the use of dynamic holograms for the control of laser beams and for the real-time wave front transformation of light beams, singular including. The techniques to realize the topological charge inversion and multiplexing as well as the frequency transformation of images, showing much promise for 3D image visualization and for data coding when using the light-beam polarization and topological charge as information parameters, have been proposed. New schemes of contactless diagnostics for functional materials have been suggested on the basis of the dynamic grating method. The possibility to separate different nonlinearity mechanisms due to variations in the wave length of laser radiation and in the grating period is shown. The methods of measuring the parameters of bulk and thin-film semiconductors and also of the activated crystals (thermo-optical coefficient, thermal diffusivity, lifetime of the carriers, lifetime of the excited state, and so on) are considered.

A detailed study of the Bragg diffraction on the regular domain structures with inclined walls in 5%MgO:LiNbO₃ crystals

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Regular domain structures (RDS) in lithium niobate crystals provide nonlinear transformations of the spectral characteristics of laser radiation in the quasi-phase-matched regime as well as controlling thereof temporal, spatial and polarization parameters with high efficiency. The linear Bragg diffraction on RDS is the nondestructive method to study of their quality and parameters. We report the results of an experimental study and theoretical analysis of Bragg diffraction on RDS