Then for every point (ω_0, ρ_0^2) on ellipse $L(c, \gamma, \varphi)$ and for every integer number n given equation has solution $R\exp(i\Lambda t)$. Real values $R = R_n(\varepsilon)$ and $\Lambda = \Lambda_n(\varepsilon)$ are presented below:

$$R_n(\varepsilon) = \rho_0 + o(1), \qquad \Lambda_n(\varepsilon) = \omega_0/\varepsilon + \Omega + 2\pi n + o(1) \quad (\varepsilon \to 0).$$

Here $\Omega = \Omega(\omega_0, \rho_0, \varepsilon)$ is some function with values in $[0,2\pi)$. Necessary and sufficient conditions of stability this solution are found. Location of stable and unstable solutions on ellipses is studied. Particularly it is shown, that: 1) there is at least one point with stable solutions and at least one point with unstable solutions on ellipse $L(c, \gamma, \varphi)$ at any parameters values; 2) region of stable periodic solutions on ellipse $L(0, \gamma, \varphi)$ is simply connected

On some features of the coupled discrete Rossler oscillators dynamics

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The parameter plane structure and transformation of attractors in the system of two coupled discrete Rossler oscillators are investigated. The discrete Rossler oscillator demonstrates the quasiperiodical dynamics so the main attention is paid to the investigation of the transformation of quasiperiodical attractors. It is shown that 3D tori, which correspond to the dynamics with three incommensurable frequencies (three-frequency quasiperiodic regimes), exist in this system both as 2D tori, and the doubling and fractalization of 3D tori is observed. Also the attractors with close to zero main Lyapunov exponent but rather complex structure are observed. It is revealed that regions of two-frequency quasiperiodic regimes can form the “synchronization” tongues or resonance networks embedded in the regions of three-frequency quasiperiodic regimes at the parameter plane.

Recent insights about solitons in optical fibers

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Fiber-optic solitons were predicted in 1973, demonstrated in 1980, and found their first commercial use in 2002. One might consider the topic mature and well understood, but nonlinear processes always hold surprises, and current research keeps producing novelties. Soliton formation from a noisy continuous wave will be discussed in terms of an Akhmediev breather. Moreover, investigations into bound states of solitons (soliton molecules) will be presented; these objects have been shown in 2012 to permit nonbinary optical data coding.