Analysis of mechanisms transition from order to chaos of superstructure described by the invariant of Lifshits with N=4

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The crystals with disproportionate phase are characterized by the occurrence at (T_i) of the phase transition temperature the initial-incommensurate phase. The temperature decreases due to the enharmonic oscillations of the main lattice and the superstructure, harmonics. The incommensurate dynamics super structures were studied of phase portraits in the coordinates R, R' and ϕ anisotropic interaction described by the Dyaloshinsky invariant [1]. The transition to chaos can be represented as a bifurcation diagram [2]. The obtained bifurcation diagram is presented in Fig. 1. Therefore, based on studies of branch diagrams for a disproportionate superstructure, it can be argued that due to bifurcations of frequency doubling, the system goes into a chaotic state.

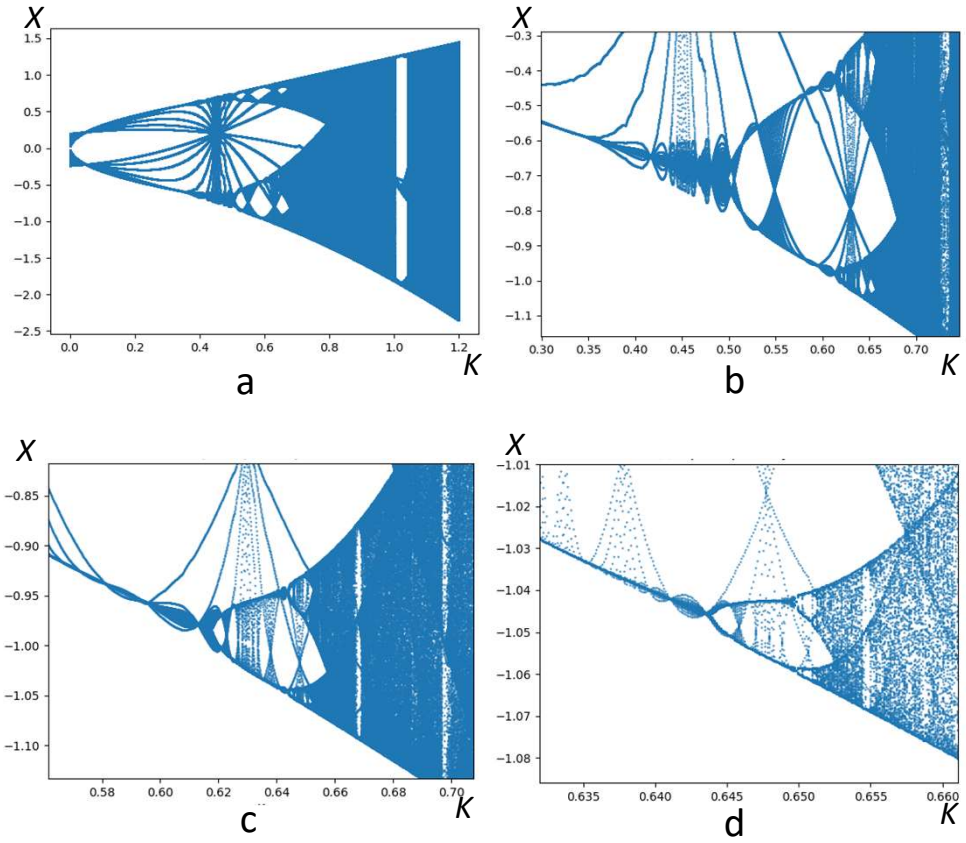

Fig.1. *The branching diagram changes the parameter K, anisotropic interaction, and is determined by the Dzialoshinsky invariant at T=1.0, n=4.*

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2. *Boeing G.* Visual Analysis of Nonlinear Dynamical Systems: Chaos, Fractals, Self-Similarity and the Limits of Prediction // Systems. – 2016. – 4. – P. 37-54 doi:10.3390/systems4040037.