Branching diagrams for a dimensional incommensurate under different symmetry of thermodynamic potential

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The dynamic systems exist characteristic features of the presence of bifurcations, which depending on the parameters of the system under consideration. It can lead to a chaotic state. It is known that the parameter *n* in the thermodynamic potential describing the incommensurate superstructure is the parameter that is responsible for the symmetry of this potential and characterizes the multiplication of the unit cell with respect to the period of the incommensurate modulation wave. A system consisting of two second-order differential equations was solved by the numerical BDF method. The calculations were performed in the Python software environment, using the JiTCODE library [1]. According to Fig. 1, an increase in the parameter *n* causes a slight decrease in existing harmonics. Therefore, the studies of branching diagrams for the disproportionate superstructure that occurs in crystals $([CH_3]_4)_2MeCl_4$ (Me = Zn; Cu; Co; Mn; Fe). The multiplication of the unit cell does not significantly affect the bifurcation process, reducing only a small number of bifurcations with increasing *n*.

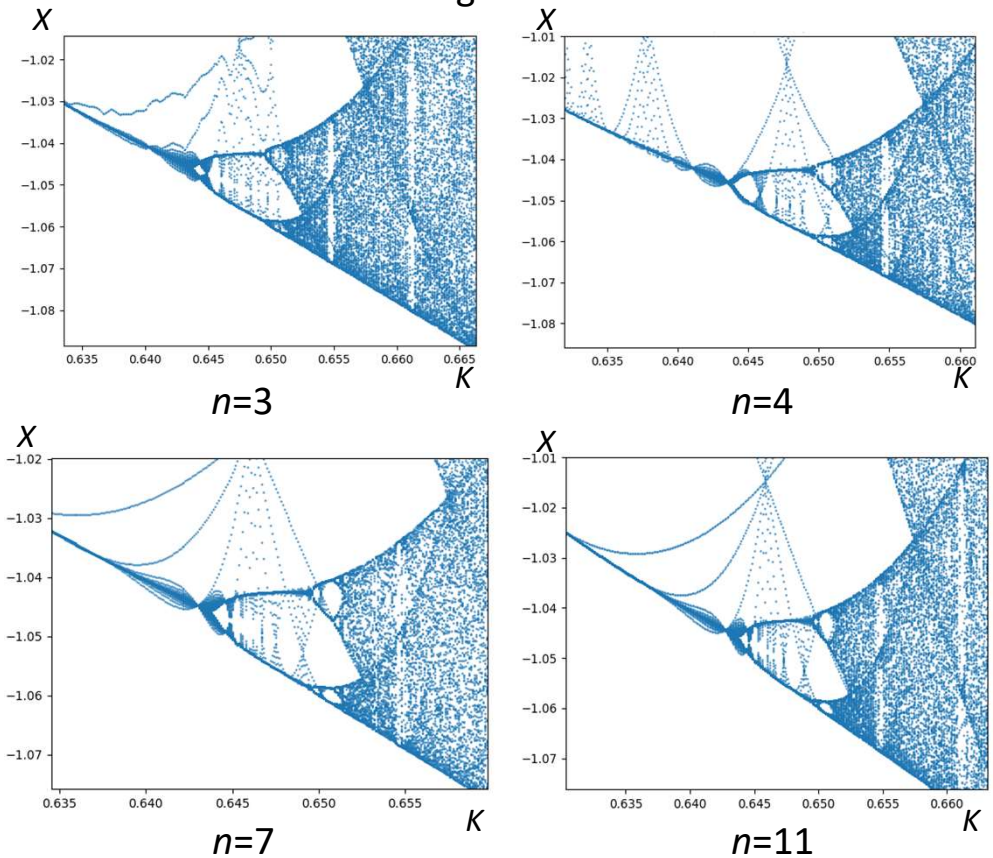

Fig.1. *The branching diagram when the parameter K changes, which describes the anisotropic interaction, and is determined by the Dzialoshinsky invariant at T=1 for different values of the parameter n.*

1. *Ansmann G.* Efficiently and easily integrating differential equations with JiTCODE, JiTCDDE, and JiTCSDE. Mathematical Software // Chaos: An Interdisciplinary Journal of Nonlinear Science. – 2018. – 28. – 043116.