Feature of the behavior of the wave vector of incommensurate modulation in the process of formation of the superstructure and its evolution under conditions of potential symmetry *n=4*

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The dynamic of the incommensurate superstructure systems

The dynamic of the incommensurate superstructure at the time of its occurrence, was studied from the phase portraits and Lyapunov's exponents at small values of the T and K parameters, which determine of it dynamics. The behavior of the wave vector of the incommensurate modulation was calculated from the magnitude of the long-range interaction (T) and the anisotropic interaction (K). The calculation of the studied parameters was performed in the Python environment using the libraries Skipy, JiTCODE. The calculation was performed for the incommensurate superstructure described by the Lifshitz invariant for two component parameters of the order.

The calculation of the studied parameters

a)   b)
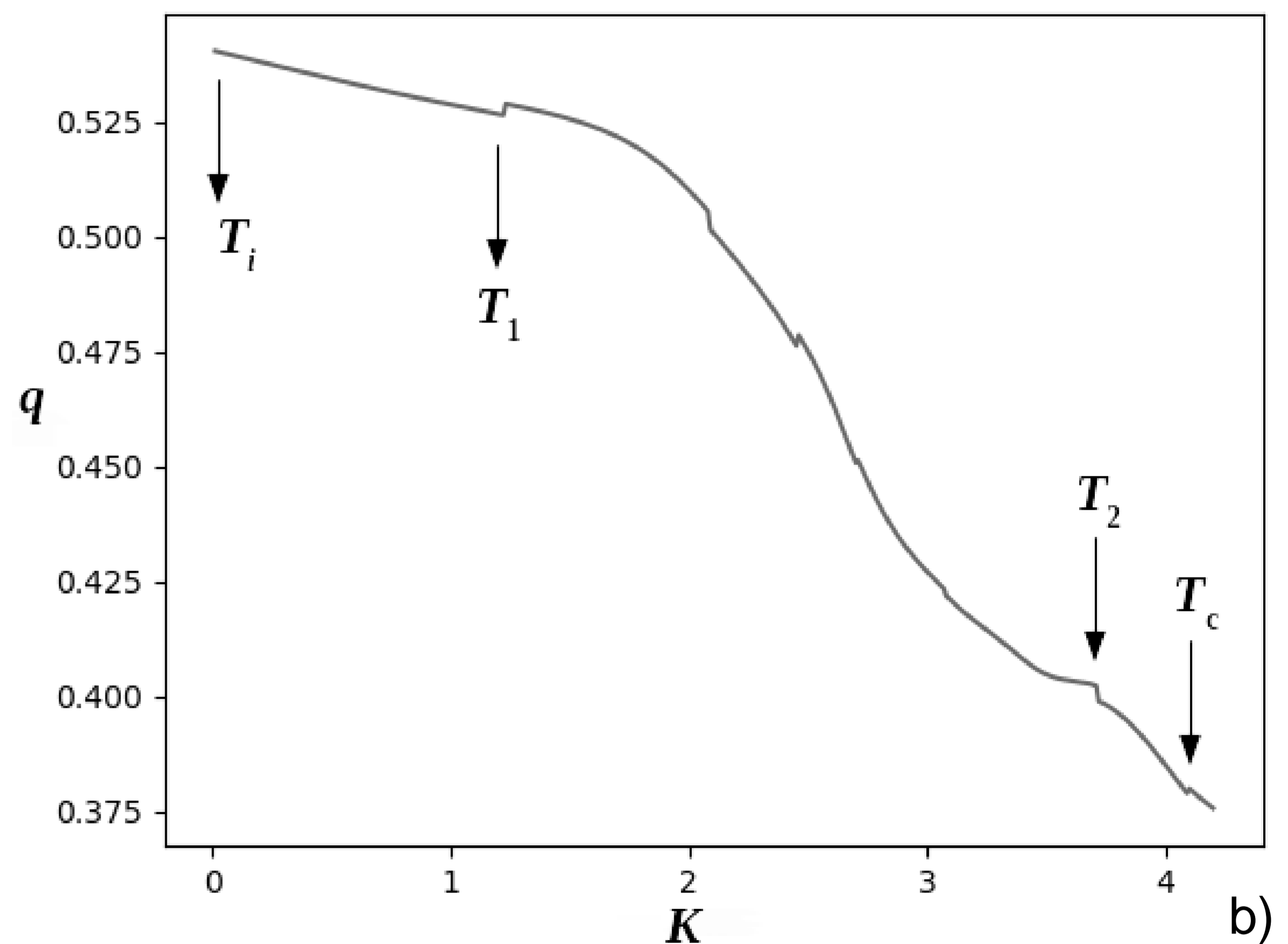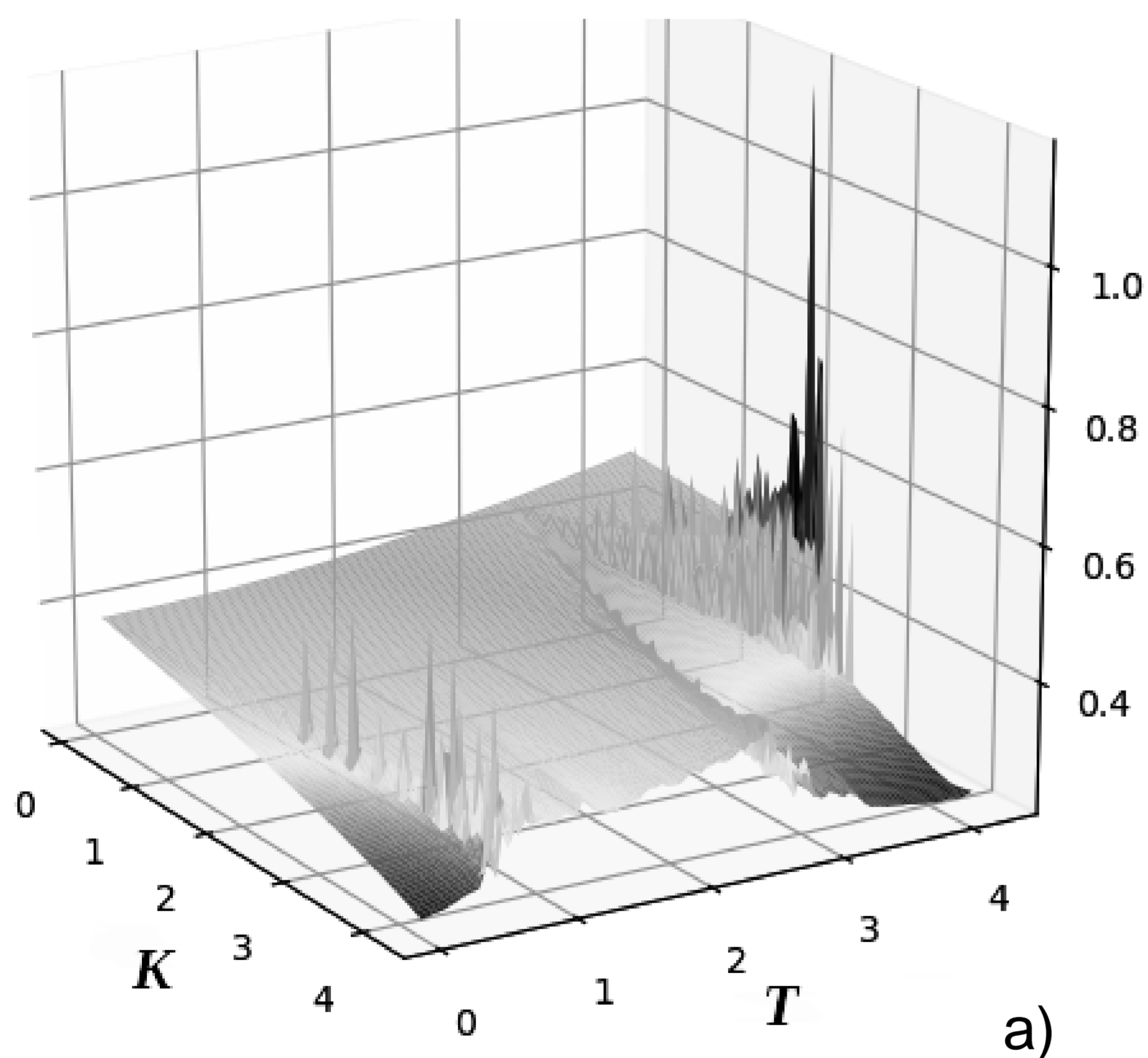
Conclusion

The figure shows the evolution of the wave vector of the incommensurate superstructure both in the process of formation of a wave of the incommensurate modulation and its behavior in the IC phase (Fig. b). It is established that an increase in the value of the long-range symteraction causes an increase in the value of q, and an increase in the value of the anisotropic interaction causes a decrease in its value (Fig. a). The rapid growth of q in the process of formation of a wave of the incommensurate modulation may be accompanied (under certain conditions) by the appearance of a chaotic unstable state, which immediately disappears.