Abstract Submitted
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Hexagonal patterns in longwave oscillatory convection in a binary liquid[1] A.A. NEPOMNYASHCHY, Technion-Israel Institute of Technology, Israel, S. SHKLYAEV, Perm State University, Russia, A. ORON, Technion-Israel Institute of Technology, Israel — Oscillatory longwave Marangoni convection is studied in a heated layer of binary mixture with the concentration gradient induced by the Soret effect. Weakly-nonlinear analysis on a hexagonal lattice shows that the cubic-order truncation of the set of amplitude equations is degenerate, so that a three-parameter family of Asynchronous Hexagons (AH) is stable in this framework. Each of AH represents a superposition of three standing waves (SW) with the amplitudes depending on their phase shifts. Twisted Rectangles (TwR) and Wavy Rolls 2 (WR2) are the particular cases of AH corresponding to equal amplitudes of SW. Another limiting case of AH is Alternating Rolls (AR) corresponding to superposition of two equal SW, while the third one vanishes. For selection of the stable patterns from AH, the fifth-order terms are accounted for. The stability analysis demonstrates that either WR2 is selected or no stable patterns exist near the stability threshold. In the latter case, a heteroclinic cycle connecting WR2, TwR, and AR emerges.

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