The properties of wave solutions in nonlocal models for structured media with noisy parameters

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Abstract:

The traveling wave solutions to a hydrodynamic model for spatio-temporal nonlocal media are considered. When fluctuations in the model are absent, these solutions satisfy the deterministic dynamical system that, according to the results of qualitative analysis methods, possesses the various localized regimes. Now we are interested in the structure of the wave solutions, when the model parameters are disturbed by Gaussian noise. Using the stochastic sensitivity function technique, the confidence ellipses for periodic trajectories obeying the period doubling scenario, hidden and spiral periodic orbits are derived. To identify the peculiarities of confidence ellipses, we consider the variation of eccentricity and area over the period of a periodic trajectory. As a result, the peculiarities for the structure of noisy wave solutions is revealed.