Minisymposium 9 - Nichtlineare Evolutionsgleichungen und Probleme mit freiem Rand

Phase dynamics in modulation equations for pattern forming systems

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We analyse the phase dynamics in modulation equations for pattern forming systems (e.g. Ginzburg-Landau equation, reaction-diffusion systems) close to the boundaries of the Eckhaus-stable domain. For this purpose we approximate the modulation equations by so-called phase-diffusion equations. The solutions of these equations are expected to describe the qualitative properties of the evolution of the pattern approximately. In some situations, for example, a waiting time phenomenon is observed in certain length- and time-scales.
We explain the extent to which the phase-diffusion equations are valid by proving estimates for these approximations.