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Oscillatory patterns near the instability threshold in extended systems with reflection symmetry ALEXANDER NEPOMNYASHCHY, IRINA SMAGIN, Technion, Haifa, Israel, VLADIMIR VOLPERT, ALEXANDER GOLOVIN, Northwestern University — It is well known that the envelope function of a modulated traveling wave spontaneously generated by a short-wave instability is governed by a complex Ginzburg-Landau equation (CGLE). Various modulation phenomena, which include the nonlinear development of a modulational instability of periodic waves in the supercritical region, as well as the formation of stable modulated waves in the subcritical region, have been extensively studied in the framework of CGLE. The nonlinear interaction between two waves moving in the opposite directions is described by a system of two non-locally coupled CGLEs that has not been studied in detail yet. We use this system for studying several phenomena related to modulations of standing waves: (i) nonlinear development of a modulational instability; (ii) propagation of defects in standing-wave patterns; (iii) subcritical modulated waves. The results are applied to problems of transverse instabilities of fronts in combustion and explosive crystallization.

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