EFFECTS OF TRANSLATIONAL COUPLING ON DISSIPATIVE LOCALIZED STATES

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ABSTRACT. Nonequilibrium localized states under the influence of translational coupling are studied experimentally and theoretically. We show that localized structures are deformed and advected in the direction of the coupling, thus undergoing different instabilities. Experimentally, localized structures are obtained in a light valve with optical feedback. By introducing a tilt of one mirror in the feedback loop, localized structures acquire a translational coupling. To understand the phenomenon in a universal framework we consider a prototypical model of localized states with translational coupling in one and two spatial dimensions. The model allows us to analytically characterize the propagation speed and the deformation exhibited by the localized state profiles as well as to figure out different mechanisms of destabilization of these dissipative structures. The results are in good qualitative agreement with the experimental and numerical observations.

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