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Pattern selection and control via localized feedback ROMAN GRIGORIEV, Georgia Institute of Technology, ANDREAS HANDEL, Emory University — Many theoretical analyses of feedback control of pattern-forming systems assume that feedback is applied at every spatial location, something that is often difficult to accomplish in experiments. We consider an experimentally more feasible scenario where feedback is applied at a sparse array of discrete spatial locations. We use generalized linear stability analysis to determine how dense the actuator array needs to be to select or maintain control of a given pattern state in the presence of noise. The one-dimensional Swift-Hohenberg equation is used to illustrate our theoretical results and explain earlier experimental observations on the control of the Rayleigh-Bénard convection.

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