DISORDERED-INDUCED TARGET PATTERNS

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Biological, ecological and chemical systems organize themselves displaying striking spatio-temporal patterns as spirals or target waves [1]. Target waves in active media are associated to local pacemakers imposing their own frequency. The emergence of these pacemakers can be due to the presence of some impurities in the system or induced by noise [2], in an otherwise homogeneous medium. However, natural systems are inherently heterogeneous. Recently, it has been shown that quasiregular concentric waves can arise in heterogeneous lattices of coupled phase oscillators induced by the disorder of the system [3]. In this work we show numerically, using the two-variable Oregonator model, how a 2-dimensional oscillatory reaction-diffusion system can exhibit a regular target pattern when there exists some disorder in the local frequencies. As the disorder increases, the concentric waves become more regular and with decreasing wavelength.

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