

Control of Pattern Formation

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We investigate the use of Pyragas time-delayed feedback to stabilize traveling plane wave solutions of the complex Ginzburg-Landau equations (CGLE). This feedback scheme exploits the temporal periodicity of the solutions to ensure that it is non-invasive: the feedback vanishes when the system is in the targeted traveling wave state. While this feedback can be effective in stabilizing waves in one space-dimension, it fails for the two-dimensional CGLE. In this case, an additional feedback involving spatial shifts of the traveling wave state is employed; this feedback exploits the spatial periodicity of traveling plane waves.