Controlling transversal instabilities of two-dimensional travelling waves in reaction-diffusion systems.

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The propagating liquid-solid interface in an undercooled fluid can undergo a Mullins-Sekerka-instability, which for example leads to the formation of snowflakes [1]. We investigate a mechanism to create such instabilities in a reaction diffusion system. With the developed curvature-dependent feedback control it is possible to counteract the role of the eikonal equation and thereby destabilize a plane wave. The appearance of the instability can be suppressed, choosing the width of the active medium below a certain threshold. This result can be explained using the Kuramoto-Sivashinsky equation.

1. J. S. Langer, *Instabilities and pattern formation in crystal growth*, Rev. Mod. Phys. **52**, 1–28 (1980)