Effects of additive noise on formation of spatial patterns in an activator-inhibitor system - DTU Orbit (24/12/2018)

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We explore the impact of additive noise on the spatial patterns emerging in an activator-inhibitor system, which is modeled by a stochastic reaction-diffusion system. By means of multiscale analysis we derive an amplitude equation around the onset of the Hopf bifurcation. Most importantly, we formulate a threshold value in terms of the noise tensor, which determines whether the additive noise will sustain or destroy the Hopf bifurcation. Finally, we carry out numerical simulations to demonstrate how the additive noise can induce the emergence of spiral and target wave patterns when a Hopf bifurcation occurs.

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