

## Multistability and time-periodic spatial pattern in the cross-diffusion SKT model

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The Shigesada-Kawasaki-Teramoto model (SKT) was proposed to account for stable inhomogeneous steady states exhibiting spatial segregation, which describes a situation of coexistence of two competing species. Even though the reaction part does not present the activator-inhibitor structure, the cross-diffusion terms are the key ingredient for the appearance of spatial patterns. We provide a deeper understanding of the conditions required on both the cross-diffusion and the reaction coefficients for non-homogeneous steady states to exist, by combining a detailed linearised and weakly non-linear analysis with advanced numerical bifurcation methods via the continuation software `pde2path`. In particular, we study the role of the additional cross-diffusion term in pattern formation, showing that the bifurcation diagram undergoes major deformations leading to multistability regions. The presence of time-periodic spatial pattern appearing via Hopf bifurcation points is also investigated.

**This is a submission for a contributed session**