**The destabilizing effect of unbalanced reaction on reaction-diffusion equations on surfaces**

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This work is a contribution to unravel the interplay between diffusivity, domain geometry and the reaction term of a scalar reaction-diffusion equation in surfaces of revolution without boundary that impacts the dynamics of the flow. The focus is on the role played by the breaking of equipartition of energy on stability issues as the diffusivity coefficient decreases. In particular the results indicate that the well-known, and exhaustively studied, connection between minimal hypersurfaces and stationary solution to the Allen-Cahn equation in riemannian manifolds may fail under any perturbation of the zeros of the reaction term -so to say- that results in the breaking of the equal-area condition.