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Patterns in bulk-surface reaction-diffusion systems with an application to cell polarisation

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Abstract

Systems of coupled bulk and surface equations model the interactions between quantities defined over 3 and 2-dimensional spaces. These constitute a particularly useful mathematical framework in many different modeling scenarios. One example is constituted by the biochemical processes leading to cell polarisation, where certain proteins give rise to a polarised pattern at the cell membrane.

In this talk, I will present and discuss different examples of surface patterning in bulk-surface reaction-diffusion systems. In particular, I will focus on minimal bulk-surface systems, with a single surface equation and a single bulk equation.