

Chemo-mechanical instabilities in polarizable active layers

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We formulate and explore a generic continuum model of a polarizable active layer with neo-Hookean elasticity and chemo-mechanical interactions. Homogeneous solutions of the model equations exhibit a stationary long-wave instability when the medium is activated by expansion, and an oscillatory short-wave instability in the case of compressive activation. Both regimes are investigated analytically and numerically. The long-wave instability initiates a coarsening process, which provides a possible mechanism for the establishment of permanent polarization in spherical geometry.

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