Instability and Electroconvection at a Electrodialysis Membrane

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\[ j_s = \frac{4}{\sqrt{\pi}} \approx 2.25. \]

Hydrodynamic instability of this solution with respect to linear 2D-perturbations is studied for the full system of equations. In contrast to the works of Rubinstein is found that the region of instability is finite with respect to the wavenumber \( \alpha \), growth rate \( \lambda(\alpha) \) has maximum at some \( \alpha = \alpha_m \) and 1D-solution is stable for sufficiently short perturbations. Direct numerical simulation of the full system of equations with a special non-uniform finite-differential grid shows that filtering mechanism of the linear stability singles out from the initial white-noise perturbations the maximum growth rate mode with \( \alpha = \alpha_m \). Secondary instability leads to chaotic flow.

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