

A free boundary problem for a nonlinear hyperbolic system: application to cell growth

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We study a system of nonlinear hyperbolic equations, with a nonlocal boundary condition and a free boundary $L(t)$, describing the cell growth in a tissue.

The existence of a solution is first provided for $L(t)=L$ fixed and known, separately for the stationary and nonstationary cases and then, the free boundary is determined from a supplementary condition.

The proofs rely on arguments from the theory of evolution equations with m -accretive operators, method of characteristics and different fixed point techniques.