

**EXPONENTIAL ASYMPTOTIC STABILITY
FOR AN ELLIPTIC EQUATION WITH MEMORY
ARISING IN ELECTRICAL CONDUCTION**

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ABSTRACT. We study an electrical conduction problem in biological tissues in the radiofrequency range, which is governed by an elliptic equation with memory. We prove the time exponential asymptotic stability of the solution, providing in this way a theoretical justification to the complex elliptic problem currently used in electrical impedance tomography.

Our approach relies on the fact that the elliptic equation is the homogenization limit of a sequence of problems for which we are able to prove suitable uniform estimates.

KEYWORDS: Asymptotic stability, Periodic solutions, Homogenization, Electrical impedance tomography.

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