

Operator Splitting Scheme for the Inverse Nagumo Equation

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Abstract : A backward or inverse problem is known to be an ill-posed problem due to its instability that easily emerges with any slight change within the conditions of the problem. Therefore, only a limited number of numerical approaches are available to solve a backward problem. This paper considers the Nagumo equation, an equation that describes impulse propagation in nerve axons, which also models population growth with the Allee effect. A creative operator splitting numerical scheme is constructed to solve the inverse Nagumo equation. Computational simulations are used to verify that this scheme is stable, accurate, and efficient.

Keywords : inverse/backward equation, operator-splitting, Nagumo equation, ill-posed, finite-difference

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