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Second Order Solitary Solutions to the Hodgkin-Huxley Equation

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Abstract : Necessary and sufficient conditions for the existence of second order solitary solutions to the Hodgkin-Huxley equation are derived in this paper. The generalized multiplicative operator of differentiation helps not only to construct closed-form solitary solutions but also automatically generates conditions of their existence in the space of the equation's parameters and initial conditions. It is demonstrated that bright, kink-type solitons and solitary solutions with singularities can exist in the Hodgkin-Huxley equation.

Keywords : Hodgkin-Huxley equation, solitary solution, existence condition, operator method
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