SEMINARIO DE MATEMÁTICA APLICADA

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Optimal control of a SIR epidemic model with general incidence function and time delays

Abstract

In this paper, we introduce an optimal control for a SIR model governed by an ODE system with time delay. We extend the stability studies of the model, by incorporating suitable controls. We consider two control strategies in the optimal control model, namely: the vaccination and treatment strategies. The model has time delays that represent the incubation period. We derive the first-order necessary conditions for the optimal control and perform numerical simulations to show the effectiveness as well as the applicability of the model for different values of the time delays. These numerical simulations show that the model is sensitive to the delays representing the incubation period.

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