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Effect of Delays on S-I Epidemic Model

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We propose a Susceptible-Infective (S-I) model with two time delays tau1 and tau2 representing a period of temporary immunity of newborns and a disease incubation period, respectively. For the full model with two discrete time delays, stability behavior of the trivial equilibrium is investigated. For the stability of endemic equilibrium point, only the case tau1=tau2 is analyzed in detail. Conditions for supercritical and subcritical Hopf bifurcation are also derived. Results are verified through computer simulations with biological interpretations given.

Key Words: Time delay, Hopf Bifurcation, Periodic solutions