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Threshold dynamics of a viral infection model with defectively infected cells

In this talk, we consider a viral infection model with defectively infected cells. We show that the basic reproduction number serves as a threshold parameter. When the basic reproduction number is less than or equal to unity, the infection-free equilibrium is globally asymptotically stable; when it is larger than unity, the infection equilibrium is globally asymptotically stable. The stability is established by Lyapunov's direct method. Here we provide a procedure to determine whether the derivative of a given type of Lyapunov function candidate is negative (semi-)definite or not.