

Minimizing peak of infected over a SIR model

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ABSTRACT

In this talk we consider a SIR model with a control $u(t)$ affecting the transmission rate β as follow:

$$\begin{aligned}\dot{S}(t) &= -(1 - u(t))\beta S(t)I(t) \\ \dot{I}(t) &= (1 - u(t))\beta S(t)I(t) - \gamma I(t) \\ \dot{R}(t) &= \gamma I(t)\end{aligned}$$

We will present the optimal solution of minimize $\max_{t \in [0, T]} I(t)$ under a L^1 constraint over u , that in [1] we called NSN strategy by null-singular-null. The proof of optimality uses Green Theorem in a suitable subset of the state space as key tool. Finally we compare numerically this strategy with which one presented in [2] where authors fix the duration that takes the control in the same dynamical system.

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References

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- [2] Morris, Dylan H and Rossine, Fernando W and Plotkin, Joshua B and Levin, Simon A: *Optimal, near-optimal, and robust epidemic control*, Communications Physics, 4(1), pp.1-8.