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Turning points and relaxation oscillations in epidemic models of SIR type

We study the effects of disease caused death on the host population via an epidemic model of SIR type. Using the geometric singular perturbation technique and the phenomenon of the delay of stability loss due to turning points, the existence of relaxation oscillations is proved, which contrast sharply to the oscillations via Hopf bifurcation. This work provides a reasonable explanation for large-amplitude oscillations with a long inter-epidemic period observed during the disease transmission.