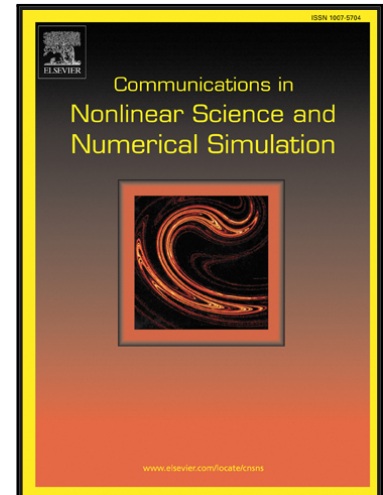


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Dynamical analysis and simulation of a 2-dimensional disease model with convex incidence

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### Highlights

- Present a general dynamical analysis on a 2-dimensional disease model, verified by numerical simulation to show bistable equilibrium solutions, Hopf and generalized Hopf bifurcations, and Bogdanov-Takens bifurcation.
- Show multiple limit cycles bifurcating from generalized Hopf bifurcation, which gives another type of bistable states, consisting of equilibrium and non-equilibrium (limit cycle), describing more realistic situation.
- Discover a new mechanism for blips phenomenon in diseases, which is based on homoclinic bifurcation, which is particularly applicable for the patients who do not feel obvious changes nor will measurable changes in disease progression be apparent.

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