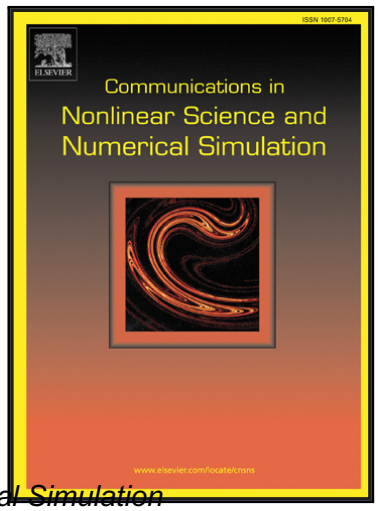

Dynamics of a lattice gas system of three species

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Highlights

- The mutualisms in a one-directional loop can lead to coexistence of species.
- A relatively weak mutualism or an extremely strong mutualism will result in extinction of one or more species.
- Species with low population density would go extinct in certain situations.
- Projection method is extended to exhibit bistability in the three-dimensional model.
- Lyapunov method is applied to exhibit unstability of heteroclinic cycles.