Abstract

Quantitative models may exhibit sophisticated behaviour that includes having multiple steady states, bistability, limit cycles, and period-doubling bifurcation. Such behaviour is typically driven by the numerical dynamics of the model, where the values of various numerical parameters play the crucial role. We demonstrate in this paper that such behaviour may also emerge in elementary set theoretical forbidding/enforcing-based models, rather than quantitative models, through the interplay of the interactions between the various components of the model. We demonstrate this for the first time using reaction systems as our modelling framework.

Keywords: Qualitative models; bistability; limit cycle; period-doubling bifurcation; reaction systems.

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