Isolated Periodic Orbits in Behavioristic Diffusion Models

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Abstract

In 1992, Feichtinger [1] discussed an advertising diffusion model showing isolated periodic behavior as a result of the occurrence of the Andronov-Hopf bifurcation. We extend his result to a model accounting for different kinds of interaction diffusion and prove existence and uniqueness of the limit cycle with the Zhang Zhifen theorem. Then we unfold a particular instance of the model equations leading to a system that describes the influence of government policy regarding drug addicts. Again, only a single stable regime is possible. The proof requires the more complicated theorem of Coppel - Zeng Xianwu in this case. All models remain within the class of those having two state variables, giving rise to families of planar vector fields.

References

[1] G. Feichtinger, Hopf bifurcation in an advertising diffusion model. *Journal of Economic Behavior & Organization*, 17(3):401–411, 1992.