

# MIMS現象数理カフェセミナー

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## Bifurcation Analysis of Periodic Traveling Wave Solutions in Excitable Reaction-Diffusion Systems

Mohammad Osman Gani (Meiji Univ. MIMS)

We are interested in the existence and stability of periodic traveling waves in two-variable excitable reaction-diffusion systems numerically. We introduce a system of reaction-diffusion equations to mimic the cardiac electrical activities. Our results based on the method of continuation show a stability change of Eckhaus type of the periodic traveling waves. There are two families of periodic traveling waves: fast and slow. The fast family is stable in the case of standard FitzHugh-Nagumo excitable system. However, we observe that the fast family becomes unstable in our model. Consequently, it bifurcates to an oscillating wave. We explain this phenomenon by numerically calculating the essential spectra of the periodic traveling waves. Moreover, we study the stability of the periodic traveling waves for the Aliev-Panfilov excitable system and compare its results with the proposed model. This is a joint work with Toshiyuki Ogawa in Meiji University.



問い合わせ:

近藤 信太郎

Email: [tz13023@meiji.ac.jp](mailto:tz13023@meiji.ac.jp)

