國立中正大學數學系
暨應用數學碩士班、統計科學碩士班

學　術　演　講

Collective Dynamics and Bifurcation in Coupled Oscillators

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Abstract

Many scientists study the mechanisms underlying synchrony, robustness, and sustainability in coupled oscillations related to biological rhythms through mathematical and computational modeling, as well as experiments. In modeling biological rhythms, each oscillator is described by a system of differential equations and regarded as a subsystem that constitutes a coupled-cell system through intercellular coupling. We aim to further understand the oscillatory properties of coupled-cell systems, such as synchronization and phase-locked solutions. In this talk, we consider an example of two Stuart–Landau oscillators under two coupling configurations: symmetric and asymmetric. We transform the coupled system into polar coordinates and perform a mathematical investigation of the dynamics of phase-locked solutions and their associated collective frequency. In addition, we investigate the global bifurcation structure of these phase-locked solutions, including transitions between symmetric and asymmetric coupling and transitions with respect to the coupling strength. These results provide insight into how coupling structure and strength influence collective oscillatory behavior and may be extended to more complex coupled systems.

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地　點:本校數學館 527 教室(嘉義縣民雄鄉大學路 168 號)

茶　會：10:30~11:00 數學館四樓 409 室舉行

歡迎參加　敬請公佈

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