明治大学先端数理科学インスティテュート

MIMS現象数理カフェセミナー

日時：2022年6月22日（水）（12:40 – 13:20）

場所：8Fラウンジ とZoomのハイブリッド形式

Spatio-temporal pattern formation on spherical microbeads in the Belousov-Zhabotinsky reaction

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Abstract： Spatio-temporal oscillations confined to quasi-2D surface layers or 3D volumes play an important role for wave-based information relay and global oscillations in living systems. The Belousov-Zhabotinsky (BZ) reaction, which self-organizes spatio-temporal patterns based on autocatalytic redox reactions, is a widely studied experimental system. Here, we observed the pattern formation on/in the spherical microbeads in which the metal catalyst of the BZ reaction was loaded either onto the surface or in the body of the beads. Various oscillatory patterns, such as global oscillations, traveling waves, and spiral waves, were observed when the bead was immersed into a BZ solution without a catalyst. These results establish a useful model system for the study of geometrical effects on nonlinear chemical processes and provide diagnostic features that allow the distinction of membrane-mediated 2D and cytosolic 3D processes in biological cells.

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