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：2021年9月29日(水) (13:30 – 14:10)

場所：今年度はZoomでのリモート開催となります

Quorum sensing in self-propelled droplets of the Belousov-Zhabotinsky reaction

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Abstract： Variety of microorganisms show drastic change in their characteristics depending on the cell density. For example, production rate of glycolysis in Yeast is almost constant over time with low cell-density, whereas it oscillates in time with high cell-density [1]. Such “quorum sensing” behavior has been reproduced using the Belousov-Zhabotinsky (BZ) reaction and one side of the fundamental mechanism was suggested using mathematical models [2]. In this case, the population density of the BZ systems were homogeneous in space. On the other hand, living cells spontaneously move and change their local cell density, resulting in quorum sensing in local. Here, we tried to realize such a local quorum sensing behavior by coupling self-propelled droplet and the BZ reaction. Our observations might be a primitive differentiation.

[1] S. Dano *et al.*, *Nature* **402**, 320 (1999).
[2] A. F. Taylor *et al.*, *Science* **323**, 614 (2009).

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