第27回

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Modeling of farmers and hunter-gatherers in the Neolithic transition of Europe

The Neolithic transition is one of the most significant single developments in human history. Archeological evidence of Neolithic transition suggests that expanding velocity of farmers is roughly constant. To understand such phenomenon, many theoretical attempts have been progressed through mathematical modeling. Existing modeling approaches on Neolithic transition indicates that expanding velocity is faster than the observed one. For understanding of this difference, we propose a three-component reaction-diffusion system which involves two different types of farmers: sedentary and migratory ones. Moreover, we introduce the influence of farming technology on the spread of farmers. Our goal is to study the relation between the expanding velocity and farming technology. In this talk, we focus on the one-dimensional traveling wave solution with minimal velocity and finally our model suggests that the minimal velocity of traveling waves explains the spreading velocity of farmers, which becomes slow down when farming technology is suitably developed. This research is a joint work with Jan Elias (Univ. Graz, Austria), Je-Chiang Tsai (National Tsing Hua Univ., Taiwan) and Masayasu Mimura (Musashino Univ., Japan).
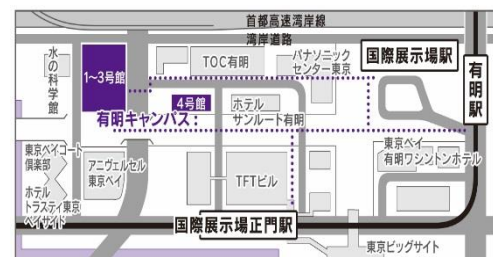
(a) $t = 0$ (b) $t = 13$

(c) $t = 35$ (d) $t = 57$
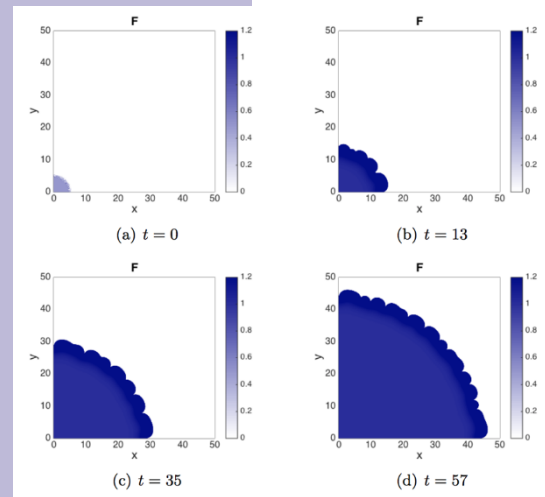
Expanding pattern of farmer populations

りんかい線「国際展示場駅」徒歩7分

1月21日 （月）16:30-18:00

武蔵野大学有明キャンパス，4号館 4階 403室

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コーディネーター： 三村 昌泰（武蔵野大学工学部数理工学科　教授）

問い合わせ先： 武蔵野大学数理工学センター
https://www.musashino-u.ac.jp/research/laboratory/mathematical_engineering/

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