

MIMS現象数理カフェセミナー

日時: 2018年6月15日(金) (12:40 - 13:20)

場所: 中野キャンパス8階 談話室

Mathematical model of biodiversity arising from competitor-mediated coexistence

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Abstract: The competitive exclusion principle (CEP), one of the pillars of theoretical ecology, states that when two or more species are competing for the same limited resources only one can eventually survive, the other being driven to extinction. However, in nature many examples of rich biodiversity are observed. Several mechanisms that can lead to species coexistence are known, but most of them occur in situations where the CEP is not applicable. We are interested in studying how indirect competition dynamics can lead to coexistence (competitor-mediated coexistence), without any apparent contradiction with the CEP. The simplest such case is when two otherwise mutually exclusive species are able to coexist thanks to the influence of a competing exotic species. We investigate mathematically this mechanism by a three-species competition-diffusion system, which displays complex patterns of dynamical coexistence even when the exotic invader is “weak”.



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