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CLASSIFICATION OF SPATIAL PATTERNS ARISING IN SPATIO-TEMPORAL DYNAMICS OF INVASIVE SPECIES

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Biological invasion of alien species is regarded as one of the major threats to ecosystems all around the world and understanding of spatio-temporal patterns arising in invasive species spread is necessary for successful management and control of harmful species. Various growth-dispersal-type models of population dynamics predict that invasive species spread can follow two qualitatively different scenarios such as the propagation of a continuous population front and the 'no-front' patchy invasion. Distinguishing between those two patterns of spread is important, in particular because the patchy invasion poses a much greater challenge for monitoring and control. However, a mathematical theory of the patchy invasion is not well developed and it still remains unclear how much this dynamical regime is different from the continuous front propagation. In my talk I will address the above issues in terms of a biologically meaningful mathematical model consisting of two coupled integral-difference equations. I will focus on classification of spatial patterns arising in the invasion problem and will suggest some criteria that can be used to distinguish between the patchy invasion and the continuous front propagation.

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