De: **CRM** crm@crm.umontreal.ca
Objet: COLLOQUE DES SCIENCES MATHÉMATIQUES DU QUÉBEC (24/02/2017, Frithjof Lutscher)
Date: 20 février 2017 14:08
À: activites@CRM.UMontreal.CA

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COLLOQUE DES SCIENCES MATHÉMATIQUES DU QUÉBEC - Montréal (CRM)
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DATE :
Le vendredi 24 février 2017 / Friday, February 24, 2017

HEURE / TIME :
16 h - 17 h / 4:00 p.m. - 5:00 p.m.

CONFERENCIER(S) / SPEAKER(S) :
Frithjof Lutscher (Université d'Ottawa)

TITRE / TITLE :
Spreading phenomena in integrodifference equations with overcompensatory growth function

LIEU / PLACE :
CRM, Université de Montréal, Pavillon André-Aisenstadt, 2920 Chemin de la Tour, salle 6254

RESUME / ABSTRACT :
The globally observed phenomenon of the spread of invasive biological species with all its sometimes detrimental effects on native ecosystems has spurred intense mathematical research and modelling efforts into corresponding phenomena of spreading speeds and travelling waves. The standard modelling framework for such processes is based on reaction- diffusion equations, but several aspects of an invasion can only be appropriately described by a discrete-time analogues, called integrodifference equations.

The theory of spreading speeds and travelling waves in such integrodifference equations is well established for the "mono-stable" case, i.e. when the non-spatial dynamics show a globally stable positive steady state. When the positive state of the non-spatial dynamics is not stable, as is the case with the famous discrete logistic equation, it is unclear how the corresponding spatial spread profile evolves and at what speed. Previous simulations seemed to reveal a travelling profile in the form of a two-cycle, with or without spatial oscillations. The existence of a travelling wave solution has been proven, but its shape and stability remain unclear.

In this talk, I will show simulations that suggest that there are several travelling profiles at different speeds. I will establish corresponding generalizations of the concept of a spreading speed and prove the existence of such speeds and travelling waves in the second- iterate operator. I conjecture that rather than a travelling two-cycle for the next-generation operator, one observes a pair of stacked fronts for the second-iterate operator. I will relate the observations to the phenomenon of dynamic stabilization.

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Responsables :
Olivier Collin (UQÀM)
Henri Darmon (Université McGill)
Dimitris Koukoulopoulos (Université de Montréal)
Iosif Polterovich (Université de Montréal)
David Stephens (Université McGill)
Hugh Thomas (UQÀM)
Yi Yang (Université McGill)