ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to a Guest Lecture

Peter Kloeden

University of Tübingen, Germany

"Forward attractors and limit sets of nonautonomous difference equations"

N.2.01 | Wednesday, 15 May 2019 | 11:00 a.m.

Abstract

The theory of nonautonomous dynamical systems has undergone major development during the past 19 years since I talked about attractors of nonautonomous difference equations at ICDEA Poznan in 1998.

Two types of attractors consisting of invariant families of sets have been designed for nonautonomous difference equations, one using pullback convergence with information about the system in the past and the other using forward convergence with information about the system in the future. In both cases, the component sets are constructed using a pullback argument within a positively invariant family of sets. The forward attractor so constructed also uses information about the past, which is very restrictive and not essential for determining future behaviour. The forward asymptotic behaviour can also be described through the omega-limit set of the system.This set is closely related to what Vishik called the uniform attractor although it need not be invariant. It is shown to be asymptotically positively invariant and also, provided a future uniformity condition holds, also asymptotically positively invariant. Hence this omega-limit set provides useful information about the behaviour in current time during the approach to the future limit.

References [1] P. E. Kloeden, T. Lorenz, The construction of non- autonomous forward attractors, Proc. Amer. Mat. Soc. 144 (2016), no. 1, 259-268. [2] P. E. Kloeden, Meihua Yang, Forward attraction in nonautonomous difference equations, J. Difference Equ. Appl. 22 (2016), 513-525. [3] P. E. Kloeden, Asymptotic invariance and the discretisation of nonautonomous forward attracting sets , J. Comput. Dynamics, 3 (2016), 179-189

Christian Pötzsche and the Department of Mathematics look forward to seeing you at the talk!