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From invariant manifolds to fiber bundles: Numerical dynamics of integrodifference equations

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Integrodifference equations are successful models to describe spatial dispersal and temporary evolution. For this reason they can be understood as a discrete-time counterpart to reaction-diffusion equations and form an interesting class of infinite-dimensional dynamical systems. Nevertheless, for the sake of numerical simulations integrodifference equations require a spatial discretization.

In this talk, we investigate how their full hierarchy of invariant manifolds (stable, center-stable, center, center-unstable, unstable) behaves under the commonly used discretizations methods. We begin with the classical situation near periodic solutions and proceed to a general nonautonomous framework.

[1] F. Lutscher, *Integrodifference Equations in Spatial Ecology*, Interdisciplinary Applied Mathematics, Springer, Cham, 2019.

[2] C. Pötzsche, Numerical dynamics of integrodifference equations: Periodic solutions and invariant manifolds in $C^\alpha(\Omega)$, submitted (2021)

[3] C. Pötzsche, Numerical dynamics of integrodifference equations: Hierarchies of invariant bundles of $L^p(\Omega)$, Numer. Funct. Anal. Optimization, accepted (2023)