



Seminar of the Work Group
Nonlinear Partial Differential Equations
SS 22

Speaker: Mia Jukic

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Pinning and propagation reversal on infinite k -ary trees

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Abstract

Wave-pinning is a famous property of traveling wave solutions to bistable reaction-diffusion LDEs (lattice differential equations) posed on the integer lattice \mathbb{Z} . In short, for small diffusion parameters, the wave speed is zero, and the wave does not propagate for a range of bistable parameters. This result inspired us to study traveling wave solutions to LDEs posed on infinite k -ary trees. Our primary question is how propagation direction of the wave changes as we vary the diffusion parameter d and the bistable parameter a . We show that small diffusion leads to pinning. With increasing diffusion, the wave travels in both directions, depending on the parameter a . However, as we further increase the diffusion, the wave propagates in a single direction, for all bistable parameters a . This phenomenon does not happen for the traditional LDEs posed on the integer lattice. In particular, our results imply that the change of diffusion parameter can lead to the reversal of the propagation direction.