# Propagation reversal for bistable differential equations on trees

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We study traveling wave solutions to the bistable differential equations on infinite $k$-ary trees in the form

$$\dot{u}_i = d(ku_{i+1} - (k+1)u_i + u_{i-1}) + g(u_i; a),$$

in which $i \in \mathbb{Z}$, $d > 0$ and $g \colon \mathbb{R} \to \mathbb{R}$ is a bistable nonlinearity of the Nagumo type, e.g.,

$$g(s; a) = s(1-s)(s-a), \quad a \in (0, 1).$$

In this talk, we discuss how comparison principles and construction of explicit lower and upper solution can be used to obtain information about the dependence of the wave speed $c \in \mathbb{R}$ on the parameters $a, d, k$.

In particular, we show that for certain range of the detuning parameter $a$ the changes to the diffusion parameter $d$ lead to a reversal of the propagation direction.

Joint work with Hermen Jan Hupkes, Mia Jukić (Mathematisch Instituut, Universiteit Leiden) and Petr Stehlík (Department of Mathematics, Faculty of Applied Sciences, University of West Bohemia)