HETEROCLINIC TRAVELING-WAVE TYPE SOLUTIONS FOR REACTION-DIFFUSION-CONVECTION EQUATIONS WITH SATURATING DIFFUSION

Maurizio Garrione
(University of Milano-Bicocca, Milan, Italy)

We will deal with a 1-dimensional reaction-diffusion-convection PDE like

$$u_t = \left(\frac{u_x}{\sqrt{1+u_x^2}} \right)_x - h'(u)u_x + f(u),$$

where the diffusion is of mean-curvature type and both convection and reaction terms are present. We will assume $f(0) = 0 = f(1)$ and search for traveling-wave type solutions $u(x,t) = v(x+ct)$ connecting the two equilibria 0 and 1. Through the use of a suitable change of variables, we will translate this problem into the search for a solution to a two-point problem in the interval $[0,1]$, and determine the set of the admissible speeds (i.e., the numbers c for which a solution of this kind exists) for different kinds of reaction and convection terms, thanks to a shooting technique. We will also make some comments about the dependence of such admissible speeds on a viscosity parameter ϵ braking the diffusion.