Front propagation in reaction-diffusion-convection equations with combustion nonlinearity

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We study the existence and properties of traveling wave solutions to the reaction-diffusion-convection equation on the real line

$$v_t = (D(v)|v_x|^{p-2}v_x)_x + h(v)v_x + g(v), \quad p > 1,$$

where D is a positive diffusion coefficient, g is a Lipschitz reaction term of combustion type and h represents the convective velocity. We extend the results established for $p = 2$ to the case $p > 1$ and present sufficient conditions for existence and nonexistence of traveling waves connecting equilibria 0 and 1. We also discuss how the value of p and the Lipschitz continuity of g affect the asymptotic behaviour of solutions.

This is a joint work with Pavel Drábek (University of West Bohemia).

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