

Elliptic and parabolic equations with dynamical boundary conditions

Marek Fila

Department of Applied Mathematics and Statistics, Comenius University,
Mlynská dolina, 84248 Bratislava, Slovakia

We shall discuss three related problems:

$$\begin{aligned}u_t &= \Delta u, & x \in \Omega, t > 0, \\u_\nu &= u^q, & x \in \partial\Omega, t > 0, \\u(x, 0) &= u_0(x) \geq 0, & x \in \Omega,\end{aligned}$$

$$\begin{aligned}\Delta u &= 0, & x \in \Omega, t > 0, \\u_t + u_\nu &= u^q, & x \in \partial\Omega, t > 0, \\u(x, 0) &= u_0(x) \geq 0, & x \in \partial\Omega,\end{aligned}$$

and

$$\begin{aligned}u_t &= \Delta u, & x \in \Omega, t > 0, \\u_t + u_\nu &= u^q, & x \in \partial\Omega, t > 0, \\u(x, 0) &= u_0(x) \geq 0, & x \in \Omega,\end{aligned}$$

where Ω is a bounded domain in \mathbb{R}^N and $q > 1$. We shall focus mainly on the question: Where and with which rate do solutions blow-up?