SEMINARIUM UKŁADY DYNAMICZNE

Tytuł: **Stationary solutions and connecting orbits for nonlinear parabolic equations at resonance**

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For an open bounded set $\Omega \subset \mathbb{R}^n$ with the boundary $\partial\Omega$ of class C^∞, we study the nonlinear parabolic partial differential equations of the form

$$\begin{cases} u_t(t,x) = -\mathcal{A}(x,D)\,u(t,x) + \lambda\,u(t,x) + f(x,u(t,x),\nabla u(t,x)), & t > 0,\ x \in \Omega \\ \mathcal{B}(x,D)\,u(t,x) = 0, \qquad t \geqslant 0,\ x \in \partial\Omega \end{cases}$$

where λ is a real number, $\mathcal{A}(x,D)$ is a uniformly elliptic differential operator of degree $2m$, $m \geqslant 1$, with a set of boundary operators $\mathcal{B}(x,D) := \{\mathcal{B}_j(x,D)\}_{j=1}^m$ and $f\colon \Omega \times \mathbb{R} \times \mathbb{R}^n \to \mathbb{R}$ is a mapping of class C^1. We consider the case when the equation is at resonance, i.e., λ is an eigenvalue of $(\mathcal{A}(x,D), \mathcal{B}(x,D))$ and f is bounded. Imposing appropriate Landesman–Lazer type conditions we use the Rybakowski extension of Conley index to derive a criterion determining the existence of multiple stationary solutions and trajectories connecting them.