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Mês de: JANEIRO 2013

SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 24 de Janeiro (quinta-feira), às 13h30, na Sala B3-01

Doubly degenerate parabolic equations with nonstandard growth

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Abstract:

The talk addresses the homogeneous Dirichlet problem for the parabolic equation with anisotropic and variable nonlinearity

$$\partial_t \left(|u|^{m(x,t)-1}u \right) = \sum_{i=1}^{n} D_i \left(|D_i u|^{p_i(x,t)-2} D_i u \right) + f(x,t,u). \tag{1}$$

The exponents $m > 0$, $p_i > 1$ and the low-order term f are given functions of their arguments. Despite formal similarity between equation (1) and the equation $\partial_t \left(|u|^{\gamma-1}u \right) = \Delta_p u + f(x,t,u)$ with constant exponents γ and p, the solutions of the former possess a number of specific properties, which are due to the variable nonlinearity and the anisotropy of the diffusion part. The main issues of the talk are existence of weak and strong solution in suitable Orlicz-Sobolev spaces, classes of uniqueness, blow-up and extinction of solutions in a finite time, non-propagation of disturbances from the initial data. A background information and part of the results can be found in the papers

S. Antontsev, S. Shmarev, *Doubly nonlinear equations with variable nonlinearity I: existence of bounded strong solutions.* Adv. Differential Equations V. 17, Numbers 11-12 (2012), 1181–1212.

S. Antontsev, M. Chipot, S. Shmarev, *Uniqueness and comparison theorems for solutions of doubly nonlinear parabolic equations with nonstandard growth conditions.* To appear in Commun. Pure Appl. Anal V. 12, Number 4 (2013)

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