

Energy Solutions of Parabolic PDEs with Nonstandard Growth: Existence, Localization, Blow-up

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We review recent results on the solvability and qualitative properties of solutions to parabolic equations with nonstandard growth. A prototype of such equations is furnished by the equation

$$u_t = \sum_{i=1}^n D_{x_i} (|D_{x_i} u|^{p_i(x,t)-2} D_{x_i} u) + a(x,t)|u|^{\sigma(x,t)-2} u + f$$

with variable exponents of nonlinearity p_i and σ . The main issues of the talk are:

- sufficient conditions for the existence of energy solutions,
- the influence of anisotropy and variable nonlinearity on the possibility of space/time localization of solutions,
- finite time extinction or blow-up in eventually linear equations.