ON THE BLOW-UP OF SOLUTIONS OF PARABOLIC EQUATIONS WITH ANISOTROPIC NONLINEARITY AND NONSTANDARD GROWTH

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The talk addresses the question of blow-up of solutions of the homogeneous Dirichlet problem for the equations

$$u_t = \sum_{i=1}^{n} D_i \left(a_i |D_i u|^{p_i(z)-2} D_i u \right) + \sum_{j=1}^{k} b_j |u|^{\sigma_j(z)-2} u.$$

The coefficients a_i, b_j and the exponents of nonlinearity p_i, σ_j are given functions satisfying the conditions: $a_i(x,t)$ are bounded and strictly positive in Q, $b_j(x,t)$ are bounded in Q, there exist constants $p^{\pm}$ and $\sigma^{\pm}$ such that

$$p_i(x,t) \in [p^-, p^+] \subset (1,\infty), \qquad \sigma_j(x,t) \in [\sigma^-, \sigma^+] \subset (1,\infty), \tag{0.1}$$

p_i and σ_j are Hölder-continuous with logarithmic module of continuity

$$|p_i(\eta) - p_i(\zeta)| \le C \, \frac{1}{\ln \frac{1}{|\eta-\zeta|}}, \quad C = const > 0, \tag{0.2}$$

for all $\eta, \zeta \in \overline{Q}$ such that $|\eta - \zeta| < 1/2$. The results were obtained in collaboration with S. Antontsev, the presentation follows the recent papers [1, 2, 3].

References

[1] S. Antontsev and S. Shmarev, *On the Blow-up of Solutions to Anisotropic Parabolic Equations with Variable Nonlinearity*, Proc. of the Steklov Mathematics Inst., 270 (2010), pp. 33-48

[2] S. Antontsev and S. Shmarev, *Blow-up of solutions to parabolic equations with nonstandard growth conditions*, J. Comput. Appl. Math., 234 (2010), pp. 2633–2645.

[3] S. Antontsev and S. Shmarev, *Anisotropic parabolic equations with variable nonlinearity*, Publ. Mat., 53 (2), (2009), pp. 355–399.

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