

Anisotropic singular models: 1D case

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Anisotropic systems in class of singular parabolic equations generate unusual structures of solutions. One of the most spectacular phenomena are flat regions of solutions, called by the theory: *facets*. Such effects are consequences of the very high singularity of the nonlinear elliptic operator. If the system is anisotropic then the shape of the facets is determined by the anisotropy. From that reason such models find naturally a place in the theory of crystal growth and image processing.

The goal of my talk is to present some current results concerning model problems. I plan to consider the mono-dimensional system

$$u_t - \partial_x(L(u_x)) = 0$$

on an interval with Dirichlet boundary conditions. Fundamental examples are

$$L_0(p) = \operatorname{sgn} p \quad \text{and} \quad L_1(p) = p + \operatorname{sgn} p.$$

For such systems we are able to construct a complete theory explaining the qualitative features of solutions.

My talk is based on joint results with Piotr Rybka (Warszawa) and Karolina Kielak (Warszawa).

References

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