Piotr Mucha

Facets and discontinuous elliptic operator

I plan to discuss properties of solutions to the following mono-dimensional problem

$$u_t - \partial_x(u_x + \mathrm{sgn}(\mathrm{u_x})) = 0$$

considered in fixed interval with given Dirichlet data, possible nonzero. The system can be viewed as a regularization of the total variational flow.
A key point are facets, flat regions of solutions which appear in evolution of the solutions. I'd like to analyze creations and dynamics of them and "typical" profiles of solutions. Some features of the stationary system will be discussed too. My talk will be based on joint results with Piotr Rybka (Warsaw).

PB Mucha, Regular solutions to monodimensional model with discontinuous elliptic operator, Interfaces and Free Boundaries (2012)
PB Mucha, P Rybka, A note on a model system with sudden directional diffusion, Journal of Statistical Physics (2012)