

Oberseminar Nichtlineare Differentialgleichungen

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An L^1 based approach to optimal relaxation of gradient flows: bump-like solutions of the 1-D Cahn-Hilliard equation

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Abstract: We will review the classical approaches to obtain exponential or algebraic rates of convergence towards minimizers of the energy in the case of gradient flows in (strictly) convex energy landscapes. We will discuss advantages and disadvantages of this method generalized to mildly non-convex energies and in particular try to understand in which cases this approach yields optimal rates. In the second part of the talk we will consider a more robust, but related method that relies on L^1 -type distances instead of the "natural" distance associated to the gradient flow. By means of example we will consider the Cahn-Hilliard equation in one dimension and look at solutions with two transition layers. Here, in contrast to the case of one transition layer, the long-time limit is not fixed by mass conservation and in order to control the dynamics, a detailed understanding of the movement of the transition layers is needed. This talk is based on joint work with Sarah Biesenbach and Maria G. Westdickenberg.

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