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Section:

8. Analysis

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Asymptotic behavior of a gradient flow
It is known that if φ is a convex and even function on a Hilbert space H such that $\min_H \varphi$ is achieved, then the (weak) solution u of the initial value problem $du/dt + \partial\varphi(u) \ni 0, \quad u(0) = x$ converges strongly as $t \to \infty$. However, it is unknown whether the same is true of the solution u to the inhomogeneous problem $du/dt + \partial\varphi(u) \ni f, \quad u(0) = x$, where $f \in H$. (This is a question asked by H. Brezis.) The main purpose of this paper is to give a partial answer to this question.
Reference: H. Brezis, Asymptotic behavior of some evolution systems, in "Nonlinear Evolution Equations" (M. G. Crandall, Ed.), Academic Press, 1978, pp. 141–154.