

Asymptotic Behavior of Solutions to a Second Order Evolution Equation

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Abstract

By using our previous results on Almost Nonexpansive sequences and curves in a Hilbert space for dissipative systems, we investigate the weak and strong convergence of solutions to the following nonhomogeneous second order evolution equation:

$$\begin{cases} u''(t) \in Au(t) + f(t) & a.e. \quad t \in (0, +\infty) \\ u(0) = u_0, \quad \sup_{t \geq 0} |u(t)| < +\infty \end{cases}$$

where A is a maximal monotone (possibly multivalued) operator in a real Hilbert space H , and $f : \mathbb{R}^+ \rightarrow H$ is a suitable function. Our results extend previous results by several authors who studied the homogeneous case $f \equiv 0$, with the additional assumption $A^{-1}(0) \neq \emptyset$.

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