1059-47-30 **Behzad Djafari Rouhani*** (behzad@utep.edu), Mathematical Sciences Department, University of Texas at El Paso, 500 W. University Ave., El Paso, TX 79968. *Asymptotic behavior of solutions to some second order evolution equations.*

We consider the following class of second order nonhomogeneous evolution equations

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

where A is a maximal monotone operator in a real Hilbert space H, c is a real number, and $f : \mathbb{R}^+ \to H$ is a given function. We study the asymptotic behavior of bounded solutions to these evolution equations. In particular, with suitable conditions on f, we show that for $c \leq 0$, solutions always converge weakly to an element of $A^{-1}(0)$, and strong convergence may not occur in general. In contrast, for $c > 0$, we show that solutions always converge strongly to an element of $A^{-1}(0)$. Some applications will be also presented. Our results for $c \leq 0$ extend previous results by several authors who assumed that $A^{-1}(0) \neq \phi$. The case of $c > 0$ was not previously studied and is new even for ordinary differential equations in one dimension. (Received February 02, 2010)