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SOME RESULTS ON ASYMPTOTICALLY PSEUDOCONTRACTIVE MAPPINGS

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Abstract. Let K be a nonempty closed convex subset of a real Banach space E, $T : K \to K$ a uniformly continuous asymptotically pseudocontractive mapping having $T(K)$ bounded with sequence $\{k_n\}_{n\geq 0} \subset [1,\infty)$, $\lim\limits_{n\to\infty} k_n = 1$ such that $p \in F(T) = \{x \in K : Tx = x\}$. Let $\{\alpha_n\}_{n\geq 0}, \{\beta_n\}_{n\geq 0} \in [0,1]$ be such that $\sum_{n\geq 0} \alpha_n^2 = \infty$ and $\lim\limits_{n\to\infty} \alpha_n = 0 = \lim\limits_{n\to\infty} \beta_n$. For arbitrary $x_0 \in K$ let $\{x_n\}_{n\geq 0}$ be iteratively defined by

$$\begin{aligned} x_{n+1} &= (1-\alpha_n)\, x_n + \alpha_n T^n y_n, \\ y_n &= (1-\beta_n)\, x_n + \beta_n T^n x_n,\ n \geq 0. \end{aligned}$$

Then $\{x_n\}_{n\geq 0}$ converges strongly to $p \in F(T)$.
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