Admissible perturbations of $\alpha$-$\psi$-pseudocontractive operators: convergence theorems

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In the last decades, the study of convergence of fixed point iterative methods has received an increasing attention, due to their performance as tools for solving numerical problems. As a consequence of this fact, one can access to a wide literature on iterative schemes involving different types of operators; see [2, 4, 5]. We point out that fixed point iterative approximation methods have been largely applied in dealing with stability and convergence problems; see [1, 6]. In particular, we refer to various control and optimization questions arising in pure and applied sciences involving dynamical systems, where the problem in study can be easily arranged as a fixed point problem. Then, we prove some convergence theorems for a certain class of operators in real Hilbert spaces. Precisely, by using the concept of admissible perturbation of $\alpha$-$\psi$-pseudocontractive operators in Hilbert spaces, we establish results for Krasnoselskij type fixed point iterative schemes. Our theorems complement, generalize and unify some existing results; see [3, 4].

References