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# COINCIDENCE PRINCIPLES AND FIXED POINT THEORY FOR MAPPINGS IN LOCALLY CONVEX SPACES

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ABSTRACT. We present a coincidence principle for concentrative maps. This leads to new fixed point theory for nonlinear operators.

**1. Introduction.** A general coincidence theory is presented for concentrative mappings between locally convex Hausdorff linear topological spaces in this paper. These general results are used to obtain a variety of new fixed point theorems for the sum of two operators, for example, an $m$-accretive plus a condensing operator, between Banach spaces (one could also obtain results for operators between locally convex Hausdorff linear topological spaces). The fixed point results were motivated from a variety of sources, in particular we mention the work of Browder [**4**], Daneš [**7**], Furi and Pera [**14**], Gatica and Kirk [**15**], Granas [**16**], Petryshyn [**25**], Precup [**26**], Reinermann [**27**] and Schöneberg [**28**]. Some applications of our results are also presented in this paper.

For the remainder of this section we gather together some definitions and some known facts. Let $(E,d)$ be a pseudometric space [**18**] and $M$ a subset of $E$. For $x \in M$, let $B(x,\varepsilon)$ denote the closed $\varepsilon$-ball with center $x$, i.e., $B(x,\varepsilon) = \{y \in E : d(x,y) \leq \varepsilon\}$. The *measure of noncompactness* of the set $M$ is defined by

$$\alpha(M) = \inf Q(M); \qquad \inf(\varnothing) = \infty,$$

where

$$Q(M) = \{\varepsilon \in \mathbf{R} : \varepsilon > 0 \text{ and there is a finite } \varepsilon\text{-net for } M \text{ in } E \\ \text{i.e., } M \subseteq B(A,\varepsilon) \text{ for some finite subset } A \text{ of } E\}.$$

Note $B(A,\varepsilon) = \{x \in E : \inf\{d(x,y) : y \in A\} \leq \varepsilon\}$.

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