ITES2001 Fourth Italian-Spanish conference on General Topology and its applications

Bressanone, 27-30 June 2001

k-Set contractive retractions and k-set contractions in spaces of continuous functions

Giulio Trombetta
Dipartimento di Matematica Arcavacata di Rende
Università della Calabria, Italy

Let X be an infinite-dimensional Banach space, and let B and S be its close unit ball and unit sphere, respectively. A continuous mapping $R : B \to S$ is said to be a retraction provided that $x = Rx$ for all $x \in S$. We prove that in some Banach spaces of continuous functions for every $\varepsilon > 0$ there exists a retraction of the close unit ball onto the unit sphere being a $(1 + \varepsilon)$-set contraction. This result and the properties of the fixed-point index of a k-set contraction with $k < 1$ are the main tools in order to obtain a theorem on the existence of positive eigenvalues of k-set contractions.