

ICRAMCS 2026

THE EIGHTH EDITION OF THE INTERNATIONAL CONFERENCE ON
RESEARCH IN APPLIED MATHEMATICS AND COMPUTER SCIENCE

April 23-24-25, 2026 | Marrakech, Morocco



On some fixed point theorems without convexity

Communication Info

Authors:

Soukaina El Bazi¹

Ahmed Zeghal¹

¹ Laboratory of Mathematics
and Applications, FST Tangier,
Abdelmalek Essaadi
University, Morocco

Keywords:

(1) Fixed point theorems

(2) measure of nonconvexity

Abstract

Fixed point theory constitutes a fundamental tool in the investigation of nonlinear problems. Classical results in this framework typically depend in an essential way on convexity assumptions. In particular, the fixed point theorems of Schauder, Sadovskii, Darbo, and Krasnoselskii require the convexity of the underlying sets as a structural hypothesis.

In this work, by means of the measure of nonconvexity introduced by Eisenfeld and Lakshmikantham α_{EL} , we develop new extensions of these fixed point theorems in Banach spaces that are not necessarily reflexive, completely removing the convexity requirement on the domains. The measure α_{EL} is defined, for every bounded subset A of a Banach space X , by

$$\alpha_{EL}(A) := \sup_{x \in co(A)} \inf_{a \in A} \|x - a\| = H(A, co(A)),$$

Where $co(A)$ denotes the convex hull of A and H stands for the Hausdorff distance between A and its convex hull.

© ICRAMCS 2026 Proceedings ISSN: 2605-7700

References

[1] J. Eisenfeld, V. Lakshmikantham, On a measure of nonconvexity and applications, Yokohama Math. J. 24 (1976) 133--14.

[2] K. Latrach, M.A. Taoudi and A. Zeghal, Some fixed point theorems of the Schauder and the Krasnosel'skii type and application to nonlinear transport equations, J. Differential Equations, 221 (2006).