Topological **M**ethods in **N**onlinear **A**nalysis
Volume 67, No. 2, 2026, 637–657
DOI: 10.12775/TMNA.2025.049

© 2026 Juliusz Schauder Centre for Nonlinear Studies
Nicolaus Copernicus University in Toruń

FIXED POINT THEOREMS IN $K\Lambda$-g.l.c.s. VIA $\mathcal{M}_\Lambda$-MEASURES OF NONCOMPACTNESS

Vo Ngoc Minh — Tran Thanh Binh — Vo Viet Tri

Abstract. In this paper, we introduce a class of locally convex spaces (X, Λ) endowed with a topology generated by a family Λ of K-seminorms, along with a family of generalized non-compact measures $\mathcal{M}_\Lambda$ taking values in the corresponding family of ordered sets $(R_p, \preceq_p)_{p\in\Lambda}$. We establish several fixed point theorems for Q-Λ-g-Lipschitz operators, $\mathcal{M}_\Lambda$-g-condensing/contraction operators, and mappings defined as the sum of such operators. These results are applied to address the existence and uniqueness of nonlocal solutions to generalized integrodifferential equations. Through illustrative examples, the paper demonstrates the utility of the family of K-seminorms and the family of generalized non-compact measures $\mathcal{M}_\Lambda$ in studying the existence of fixed points.

1. Introduction

Fixed point theory for operators has, to this day, remained a focal point of interest for numerous researchers due to its wide-ranging practical applications, particularly in the field of research on the existance of solutions to differential-integral equations. The contraction mapping principle in metric spaces, epitomized by the Banach Fixed Point Theorem, has left an indelible mark on the history of mathematics. Even now, it continues to play a pivotal role in proving the existence and uniqueness of solutions to equations that can be reformulated

2020 *Mathematics Subject Classification.* Primary: 47H07, 47H08, 47H10; Secondary: 35R11, 26A33, 35B44.

Key words and phrases. Fixed point; cone normed space; measure of noncompactness; seminorm.