Nonlinear Differential Equations and Dynamical Systems NDEDS2026
A conference celebrating Alberto Cabada's 60-th birthday

6–10 July, 2026, Santiago de Compostela, Spain.

Vectorial version of the Krasnosel'skiĭ fixed point theorem

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Abstract

This poster presents a generalization of the vectorial Krasnosel'skiĭ fixed point theorem in cones using norm-type conditions. Our approach is inspired by the component-wise techniques used in [2] and [3]. By extending the classical theorem to operators acting on the Cartesian product of two Banach spaces, we allow for independent boundary conditions, either compression or expansion, for each operator component. Our main results establish the existence of at least one fixed point for a completely continuous operator under four distinct scenarios. Properties of the fixed point index provide the fundamental basis for the proof. Furthermore, an example with a system of second order differential equations is provided in order to confirm the applicability of the results.

References

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