

Analysis of Vector Equilibrium Problems with Partial Orders Induced by Certain Classes of Cones

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Abstract: The proposed PhD thesis, entitled “Analysis of Vector Equilibrium Problems with Partial Orders Induced by Certain Classes of Cones”, aims to develop a systematic framework for vector equilibrium problems ordered by cone-induced partial orders, with particular emphasis on polyhedral cones and p -order type structures. The research focuses on establishing the existence and qualitative properties of solutions, and on deriving error bounds that explicitly exploit the geometry of these structured cones. In addition, the thesis will investigate suitable dynamical approaches, such as differential and neurodynamic systems, whose trajectories converge to solutions of the target problems in a manner consistent with the underlying cone-induced orders. A further objective is to extend and refine directional well-posedness concepts in the setting of vector equilibrium problems, thereby clarifying directional stability and robustness properties of solutions. Overall, the expected contributions are both theoretical, in terms of new results and unifying perspectives, and methodological, through analytical tools that can be applied to models in optimization and network equilibrium.

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