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On the application of partial cone b-metric spaces to boundary value problem

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Abstract

In this study, we investigate the structure of Hausdorff partial cone b-metric spaces and establish several new results relevant to their analytical properties. We present a set of lemmas that characterize the convergence behavior of sequences in these spaces, thereby broadening and strengthening a number of existing fixed-point theorems. To support and clarify the theoretical developments, illustrative examples are provided. Furthermore, utilizing a fixed-point framework, we establish the existence of solutions to an associated boundary value problem, demonstrating the applicability of the obtained results.

Keywords: Fixed point, multivalued almost contractions, partial cone b-metric space, application

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