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Uniform $K$-monotonicity and $K$-order continuity in symmetric spaces with application to approximation theory. (English) Zbl 1387.41013


Summary: We investigate $K$-order continuity in a symmetric space $E$ using the fundamental function $\phi$ of $E$. We also show a connection between reflexivity and $K$-order continuity in symmetric spaces. Next, we present several results devoted to a characterization of uniform $K$-monotonicity and decreasing (increasing) uniform $K$-monotonicity in symmetric spaces. We also discuss a relationship between decreasing (resp. increasing) uniform monotonicity and decreasing (resp. increasing) uniform $K$-monotonicity. Finally, employing $K$-monotonicity properties and $K$-order continuity we provide solvability and stability of the best approximation problem in the sense of the Hardy-Littlewood-Pólya relation $\prec$ in symmetric spaces.

MSC:

41A50 Best approximation, Chebyshev systems
46B20 Geometry and structure of normed linear spaces
47H05 Monotone operators and generalizations

Keywords:
uniform $K$-monotonicity; $K$-order continuity; strict $K$-monotonicity; Lorentz space; symmetric space; the best approximation operator

Full Text: DOI

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