Variable-order Implicit Fractional Differential Equations based on the Kuratowski MNC Technique

ABSTRACT

In this manuscript, we examine the existence and the stability of solutions to the boundary value problem of Riemann-Liouville fractional differential equations of variable order. The obtained new results are based on the fixed-point theorem of Darbo and Kuratowski's metric of noncompactness (MNK) with the help of piece-wise constant functions. In addition, the derived fundamental results are proven suitable because they satisfy the Ulam-Hyers Rassias stability sufficient conditions. Several numerical examples were discussed too to demonstrate the reasonableness and effectiveness of the observed results.