

Parameter Analysis and Impulse Synchronization of Fractional-Order Newton-  
Leipnik Systems

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Abstract

In this paper, the influences of parameters on the dynamics of a fractional-order Newton-Leipnik system were numerically studied. Impulsive synchronization of two fractional-order Newton-Leipnik systems was also investigated. The ranges of the parameters used in this study were relatively broad. The system displayed comprehensive dynamic behaviours, such as fixed points, periodic motion (including periodic-3 motion), chaotic motion, and transient chaos. A period-doubling route to chaos in this study was also found. Sufficient conditions on synchronization of the two systems are provided and illustrative example is given.

Keyword : Newton-Leipnik system; fractional-order parametric analysis; impulsive synchronization