On chaos control and synchronization of the commensurate fractional order Liu system

Author(s):
Matouk, AE (Matouk, A. E.)[1,2]
E-mail: aematouk@hotmail.com
[1] Hail Univ, Fac Sci, Dept Math, Hail 2440, Saudi Arabia
Hegazi, AS (Hegazi, A. S.)[2], Ahmed, E (Ahmed, E.)[2]
E-mail: hegazi@mans.edu.eg; magd45@yahoo.com
[2] Mansoura Univ, Dept Math, Fac Sci, Mansoura 35516, Egypt

Abstract:
In this work, we study chaos control and synchronization of the commensurate fractional order Liu system. Based on the stability theory of fractional order systems, the conditions of local stability of nonlinear three-dimensional commensurate fractional order systems are discussed. The existence and uniqueness of solutions for a class of commensurate fractional order Liu systems are investigated. We also obtain the necessary condition for the existence of chaotic attractors in the commensurate fractional order Liu system. The effect of fractional order on chaos control of this system is revealed by showing that the commensurate fractional order Liu system is controllable just in the fractional order case when using a specific choice of controllers. Moreover, we achieve chaos synchronization between the commensurate fractional order Liu system and its integer order counterpart via function projective synchronization. Numerical simulations are used to verify the analytical results. (C) 2012 Elsevier B.V. All rights reserved.

KeyWords: Commensurate fractional order Liu system; Stability conditions; Chaos; Chaos control, Projective synchronization
Published in : COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 18 Issue: 5 Pages: 1193-1202 DOI: 0.1016/j.cnsns.2012.09.026 Published: MAY 2013

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