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DYNAMIC ANALYSIS OF A FRACTIONAL-ORDER RIKITAKE SYSTEM

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Abstract. The dynamic behaviors of fractional-order differential systems have received increasing attention in recent decades. But many results about fractional-order chaotic systems are attained only by using analytic and numerical methods. Based on the qualitative theory, the existence and uniqueness of solutions for a class of fractional-order Rikitake chaotic systems are investigated theoretically in this paper. The stability of the corresponding equilibria is also argued similarly to the integer-order counterpart. According to the obtained results, the bifurcation conditions of these two systems are significantly different. Numerical solutions, together with simulations, finally verify the correctness of our analysis.

Keywords. Rikitake attractor, fractional order.

AMS (MOS) subject classification: 37M05, 37D45, 34A08.

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