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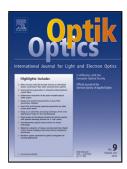
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Tracking control for a ten-ring chaotic system with an

exponential nonlinear term

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**Abstract:** A new system with an exponential nonlinear term, which can exhibit ten-ring

attractors, is introduced in this paper. The proposed chaotic system is totally different from

the existing systems in previous works. Some basic dynamical properties of the system are

analyzed theoretically and numerically. Existence and uniqueness of the solution of the

presented system are proved. Next, the tracking control for the proposed system with

exponential convergence rate is addressed. Finally, numerical simulations are also performed

to verify the effectiveness of presented schemes.

Keywords: ten-ring; chaos; tracking control

1. Introduction

Since the first classical chaotic system was discovered by Lorenz in 1963 [1], chaos

phenomenon has received more and more attention from scientific community, meanwhile,

many more three-dimensional (3D) chaotic systems were found in literatures [2-10]. By now,

chaotic systems have great potential in various fields such as cryptosystems, physics,

engineering, finance and mechanics. It is meaningful to construct new chaotic systems and

study their dynamical behaviors and dynamical properties.

Recently, there has been more interested in generating new chaotic systems with notable

features by using exponential nonlinearity. Several chaotic systems with exponential term

were obtained [11-15]. Motivated by the preceding discussion, in this paper, we introduce an

eight-term 3D chaotic system with a quadratic nonlinearity and an exponential nonlinear term.

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