Accepted Manuscript

Title: Simpler ZD-achieving controller for chaotic systems synchronization with parameter perturbation, model uncertainty and external disturbance as compared with other controllers

Author: Jian Li Mingzhi Mao Yunong Zhang

PII: S0030-4026(16)31397-3

DOI: http://dx.doi.org/doi:10.1016/j.ijleo.2016.11.071

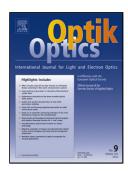
Reference: IJLEO 58486

To appear in:

Received date: 19-9-2016 Accepted date: 11-11-2016

Please cite this article as: Jian Li, Mingzhi Mao, Yunong Zhang, Simpler ZD-achieving controller for chaotic systems synchronization with parameter perturbation, model uncertainty and external disturbance as compared with other controllers, <![CDATA[Optik - International Journal for Light and Electron Optics]]> (2016), http://dx.doi.org/10.1016/j.ijleo.2016.11.071

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



ACCEPTED MANUSCRIPT

Simpler ZD-achieving controller for chaotic systems synchronization with parameter perturbation, model uncertainty and external disturbance as compared with other controllers

Jian Li^{a,b,c}, Mingzhi Mao^a, Yunong Zhang^{a,b,c,*}

^aSchool of Information Science and Technology Sun Yat-sen University, Guangzhou 510006, P.R. China

^bSYSU-CMU Shunde International Joint Research Institute, Shunde 528300, China ^cKey Laboratory of Autonomous Systems and Networked Control, Ministry of Education, Guangzhou 510640, China

Abstract

The synchronization of chaotic systems has been studied recently due to its fundamental role in engineering fields. However, many conventional synchronization controllers are designed without considering the parameter perturbation, model uncertainty or external disturbance and the design processes of most conventional controllers are relatively quite complicated. Motivated by the above considerations and inspired by the zeroing dynamics (ZD) method, a quite simple and effective ZD-achieving controller is designed for the synchronization of chaotic systems with the simultaneous existence of parameter perturbation, model uncertainty and external disturbance. Theoretical analysis and numerical simulations show the strong robustness of the ZDachieving controller, and show that the precision can be enhanced by adjusting the value of the parameter in the controller. Moreover, a modified ZD-achieving controller is designed to further improve the ZD-achieving controller. Besides, for comparison, the conventional ZD-derived controller and the linear active controller are presented. Finally, both the synchronization of two isomorphic chaos systems and the synchronization of two heteroideous chaos systems are investigated to substantiate the effectiveness and superi-

E-mail Address: zhynong@mail.sysu.edu.cn

Preprint submitted to Optik

November 12, 2016

^{*}Corresponding author.

Download English Version:

https://daneshyari.com/en/article/5025946

Download Persian Version:

https://daneshyari.com/article/5025946

Daneshyari.com