



CHAOS SYNCHRONIZATION VIA LINEAR MATRIX INEQUALITIES: A COMPARATIVE ANALYSIS

Hanéne Mkaouar¹ and Olfa Boubaker²

^{1,2} National Institute of Applied Sciences and Technology

INSAT, Centre Urbain Nord BP. 676 – 1080 Tunis Cedex, Tunisia

Emails: ¹ Hanene.mkaouar@gmail.com, ² olfa.boubaker@insat.rnu.tn

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Abstract- In this paper, three chaos synchronization approaches using Linear Matrix Inequality (LMI) tools are evaluated and compared. The comparative analysis is supported by four examples of Piecewise affine (PWA) chaotic systems: The Chua's original circuit, the Chua's modified system, the Lur'e like circuit and the five-scroll attractor system. To evaluate the performances of each synchronization approach, we examine first, the practical implementation of the LMIs. We analyze then, by simulation results, the feasibility of each approach for each PWA chaotic system. The elapsed time for solving the predefined LMIs and the influence of their tuning parameters' domain belonging on the feasibility and the performances of each approach are finally the considered comparative criteria.

Index terms: Chaos synchronization, Linear Matrix Inequalities, Piecewise Affine systems, Lyapunov stability, comparative analysis.