

Periodic Solutions for Some Systems of Delay Differential Equations

Jaume Llibre^{1,3} and Alexandrina-Alina Tarța^{1,2}

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In this paper, we give sufficient conditions for the existence of periodic orbits of some systems of delay differential equations with a unique delay having 3, 4 or n equations. Moreover, we provide examples of delay systems satisfying the different sets of sufficient conditions.

KEY WORDS: Delay equations; periodic orbits.

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1. INTRODUCTION AND STATEMENT OF THE MAIN RESULTS

These last years were published many papers dedicated to study the periodic orbits of delay differential equations, reducing the problem to look for periodic orbits of a system of ordinary differential equations. This method is called Kaplan–Yorke’s method (see for instance the references [2–10, 17]). But as far as, we know the Kaplan–Yorke’s method has not been used for finding periodic orbits of a system of differential delay equations with more than one equation. We will do this here for three different kind of systems of delay differential equations with a unique delay having 3, 4 or n equations, see systems (4–6), respectively.

In fact the periodic orbits for a system of differential delay equations with more than one equation has been studied using different methods, see

¹ Departament De Matemàtiques, Universitat Autònoma De Barcelona, 08193 Bellaterra, Barcelona, Spain. E-mail: jllibre@mat.uab.es

² Department Of Applied Mathematics, Babeş-Bolyai University, 1 Kogalniceanu Str., 400084 Cluj-Napoca, Cluj, Romania. E-mail: alina@mat.uab.es

³ To whom correspondence should be addressed.