

The analysis of stability of solutions for two coupled van der Pol's equations in a description of the heart action

Beata Zduniak

The Faculty of Applied Informatics and Mathematics, Warsaw University of Life Science, Poland

beata.zduniak@wp.pl

In this paper two coupled modified van der Pol's equations are considered. This model has a number of interesting properties allowing to reconstruct phenomena observed in physiological experiments as well as in electrocardiogram recordings. My aim is to study the stability of periodic solutions for van der Pol's system with different types of the coupling (unidirectional and bidirectional). A stable dynamics is very important in dynamical system which describes a real medical problem, because the parameters of realistic models have observational errors.

References

- [1] *J. J. Żebrowski, K. Grudziński, T. Buchner, P. Kuklik, J. Gac, G. Gielera, R. Baranowski*: Nonlinear oscillator model reproducing various phenomena in the dynamics of the conduction system of the heart. *Chaos* *17* (2007), 015121, p. 11.
- [2] *U. Forys*: Biological delay systems and the Mikhailov Criterion of stability. *J. Biol. Syst.* *12* (2004), 45–60.
- [3] *K. L. Cooke, P. van den Driessche*: On zeroes of some transcendental equations. *J. Funkcialaj Ekvacioj* *29* (1986), 77–90.