Review of: "Periodic second-order systems and coupled forced Van der Pol oscillators"

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Potential competing interests: No potential competing interests to declare.

In this paper, the authors study non-linear second order non-autonomous systems with periodic boundary conditions. It is well known that in many applications, it is very important to find periodic solutions of the above systems. Many authors have tackled this problem when the non-linearities are periodic functions, but if this is not the case, it can be a difficult task.

By using a Nagumo-type condition to control the first derivatives, the authors apply Topological Degree Theory to show the existence of at least one periodic solution for the general system. Additionally, they show that this periodic solution is localized between two particular solutions. They also provide some numerical simulations to illustrate the main result.

In the last part of the paper, the authors apply the main result to a particular and sophisticated couple of two forced Van der Pol oscillators. By properly choosing the values of the parameters for the oscillators and finding two particular solutions of the system, they show that the functions de ning the vector field given by the couple of damped Van der Pol oscillators verify all the monotonicity requirements, the Nagumo-type condition, and the rest of the hypotheses of the main Theorem, to conclude the existence of at least one periodic orbit, showing the region where it is localized.

The paper is interesting and well-written. I did not verify carefully all

computations, but they seem correct. Particularly, I liked the application to the pair of forced Van der Pol oscillators. In my opinion, the paper deserves publication in Qeios.