

# Forced oscillations for second order ODEs on a class of implicitly defined manifolds

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We study forced oscillations on differentiable manifolds which are globally defined as the zero set of appropriate smooth maps in some Euclidean spaces. Given a  $T$ -periodic perturbative forcing field, we consider the two different scenarios of a nontrivial unperturbed force field and of perturbation of the zero field. We provide simple, degree-theoretic conditions for the existence of branches of  $T$ -periodic solutions. We apply our construction to a class of second order Differential-Algebraic Equations.

This is a joint work with Marco Spadini (Università di Firenze).

## *References*

- [1] *A. Calamai, M. Spadini*: Branches of forced oscillations for a class of constrained ODEs: a topological approach. NoDEA, Nonlinear Differ. Equ. Appl. *19* (2012), 383–399.
- [2] *A. Calamai, M. Spadini*: Periodic perturbations of second order ODEs on a class of implicitly defined manifolds, submitted, arXiv:1304.6114.