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9. Ordinary Differential Equations and Dynamical Systems

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Periodic solution of a Non-Linear Dynamical System of Second order with Dimension n

In this paper we consider a non-linear dynamical system as a B . V. P that includes a system of second order differential equations with dimension n with periodic boundary conditions At first for linear part of equations, we form Green-function of homogeneous linear problem. Then we define a Fredholm Integral operator which its kernel is above Green function. Finally we show that the mentioned operator has at least one fixed point in a functional space [3,4]. These problems appear in many physical and engineering systems, such as motion of a ship and fluid dynamics considerations. References: (1). R. Kress, "Linear Integral Equations“ Springer- Verlag New York 1989. (2). B. Mehri, M. Ghorashi, E. Esmailsadeh. "Periodic behavior of anonlinear dynamical system “ J. Nonlinear Dynamics 7, 1995 (335-344) (3). Rajiv K. Singh, "Spatial thickness variations in Laser deposited thin films“ materials Science & Engineering. Volume B 45 NO 1-3 march 1997.