

## **Observation and simulation of a large signal mechanical vibrating system**

### **Abstract**

The equation of motion of  $n$ -degrees of freedom non-conservative mechanical system is represented by a Vector-Matrix differential equation. The matrix method is usually used where the natural frequencies and natural modes of vibrations are obtained, to solve this equation and a similarity transformation is always required to obtain the steady state solution. The purpose of this paper is to propose a solution, based on Cayley-Hamilton theorem, to the equation of motion of  $n$ -degrees of freedom discrete non-conservative mechanical system. The similarity transformation is not required in the proposed method, and contrary to the classical matrix method, the computations to be carried out are moderate, thus enabling use of personal computers. Simulated examples are presented to illustrate the results given in this paper.