

Finite Element Formulation and Response of Rotation Systems

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ABSTRACT

ABSTRACT The subject of the this article is to create a flexible arithmetical System which is the extension of "Finite Element Formulation and Analysis of Rotating Systems", and we use this system to assist the building of mathematical model of rotation elements. And also studying that under a rotating conservative system, what is the dynamic characteristics of a rotator in constant velocity or various velocity. Then we can use the results to compute the response of the rotator under a certain loading, and understand the behavior of the rotation mechanism. Besides, we also analyze the computing of linear and nonlinear, and getting to know what's the difference between real mode and authority. Making vibration analysis, the most important thing is to derive the controlling equation. In this article, we first use Hamilton theory to derive the equation, them apply "Finite Element Formulation" to manipulate the controlling equation of the system. As a result, we got a FORTRAN equation for VAX computer system, them we can use the equation to computer the displacement and loading of every nodes in the mechanism. The beam element model in this survey is in a 3-dimensional coordinate system, cross section has two nodes and a reference point. Each nodes has three displacements and three rotating deflection, and can bear the effects of angle velocity and angle accelerator. So through proper combination, the beam elements can be used to model rotating axis、 rotating leaves、 and crankshaft Finite Element Formulation. Furthermore, by the assistant of symbol arithmetical soft ware, we can compute the coefficient of the controlling equation skillfully, and then transfer the equation to the form of program languages, to shorten the time of programming and prevent the computing mistakes that we might make.

Keywords : 0

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