첨단 질량을 갖는 선형 원뿔대의 자유진동

신영재[†] (안동대학교 기계공학부) · 성경윤[*](경북대학교 대학원) ·
윤종학[**](안동대학교 대학원)

On the Free Vibration of Immersed Linearly Tapered Beam with a Tip Mass

Young-Jae Shin, Kyung-Yun Sung and Jong-Hak Yun

Key Words : Linearly tapered column, tip mass, Bernoulli-Euler beam, natural frequency
Abstract : A linearly tapered beam immersed partially in other material is considered and is modelled as a linearly tapered Bernoulli-Euler beam fixed at the bottom with a concentrated mass at the top. Its governing equations is derived and its free vibration analysis is performed for various boundary conditions. And the rotatory inertia of the eccentric lumped tip mass is considered.

The problem of determining the natural frequencies leads to an eighth order determinant. The solutions of the frequency equations are obtained numerically. The non-dimensional frequency parameters are given in tabular form and the influence of non-dimensional parameters on natural frequency is discussed for various conditions.

미분 변환법에 의한 쌍곡선형태 Winkler 탄성 지반상의 보 해석

신영재[†] (안동대학교 기계공학부) · 윤종학[*](안동대학교 대학원) ·
전수주[**](안동대학교 대학원)

Analysis of Beam Resting on Hyperbolic Winkler Elastic Foundation by Differential Transformation

Young-Jae Shin, Jong-Hak Yun and Su-Ju Jaun

Key Words : Hyperbolic Winlker Elastic Foundation, Differential Transformation
Abstract :   In this paper, the numerical analysis of beam resting on hyperbolic Winkler elastic foundation by differential transformation is performed. Accordig to the change of parameter of hyperbolic Winkler elastic foundation, beam deformation is computed when the boundary conditions are clamped-clamped, pined-pined and clamped-free.