NUMERICAL INVESTIGATION OF CABLE PARAMETRIC VIBRATIONS

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KEYWORDS: cable structures; parametric vibration; nonlinear analysis

It is well known that parametrically induced vibrations can get to be a considerable problem of cable lightweight structures [1]. The scope of this paper is to investigate adequacy of applying different types of FEM elements for dynamic instability problems investigation of cable structures. Parametric unstable vibrations of inclined cable structures induced by the vertical harmonic support excitation are considered. Two types of nonlinear elements for numerical models are investigated. The first one is the axial element, most used for engineering design of cables structures, and the second one is more complicated elastic catenary element [2] based on analytical solution functions. Suitability of above mentioned elements to compute a nonlinear dynamic analysis of cable structures is compared. The numerical calculation is carried out by the program language “Wolfram Mathematica 8.0” with implemented Predictor-Corrector method, and check out compliance with known solutions [3].

REFERENCES