

عنوان مقاله:

AN INVESTIGATION ON THE DYNAMIC RESPONSE OF CRACKED TIMOSHENKO BEAMS WITH MOVING MASS

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نویسنده:

a Ariaei - Department of Mechanical Engineering, Faculty of Engineering, University of Isfahan, Hezar Jerib Ave.,
Isfahan, Iran

خلاصه مقاله:

An analytical method is presented to determine the effect of open and breathing cracks on the dynamic behavior of the undamped Timoshenko beams subject to a moving mass. In equations of motion, considering the moving mass causes convective acceleration terms; the same terms are not presented when the moving load is assumed. The cracked beam is modeled as numbers of segments connected by two massless springs (one extensional and another one rotational). Considering the compatibility requirements on the cracked section, the relationships between any two spans can be obtained. By using the analytical transfer matrix method, eigensolutions of the cracked system can be calculated explicitly. By considering a breathing crack that opens and closes continuously during oscillation, the instantaneous frequencies are used to determine instantaneous mode shapes (IM) for dynamic response calculation of the beam subjected to a moving mass. Several numerical examples are also designed to evaluate the crack effects by considering the external acceleration terms consisting of four separate terms

کلمات کلیدی:

Open and breathing cracks, Timoshenko beams, Moving mass, Transfer matrix method

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