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Dynamics Of A Delaminated Timoshenko

This paper presents dynamic response of a delaminated composite beam under the action of moving oscillatory mass. The Poisson's effect, shear deformation and rotary inertia have been considered in this analysis. We have used the constrained mode model to simulate the behavior between the delaminated

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surfaces. Based on this model, eigen-solution technique is used to obtain the natural frequencies and their corresponding mode shapes for the delaminated beam.

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Dynamics of a Delaminated Timoshenko Beam Subjected to a Moving Oscillatory Mass Article (PDF Available) in Mechanics Based Design of Structures and Machines 40(2) · April 2012 with 121 Reads

(PDF) Dynamics of a Delaminated Timoshenko Beam Subjected ...

Dynamics of a composite Timoshenko beam with delamination 1. Introduction. It is well known that delamination is one of the most important failure mechanisms in composite... 2. Basic equations. If one starts from the equilibrium equations written

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for each layer it is easy to obtain the... 3. Results ...

Dynamics of a composite Timoshenko beam with delamination ...

The static and dynamic stability of the composite beam with a single delamination are investigated using the Timoshenko beam theory. The mechanical model is discretized using the finite element method and the equation of motion is obtained using Hamilton's principle.

Dynamic Stability of a Structurally Damped Delaminated ...

Dynamic behavior of a composite Timoshenko beam with single delamination has been presented by Manoach and Warminski [28]. Transient response of a delaminated composite Timoshenko beam under the ...

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Dynamics of a composite Timoshenko beam with delamination ...

Dynamic analysis of the rotating delaminated beam has received limited attention. Recently, Liu and Shu presented analytical solutions for the free vibrations of rotating isotropic beams with multiple delaminations. The Timoshenko beam theory and both the free mode and the constrained mode assumptions in delaminated region have been used.

Dynamic behavior of a rotating delaminated composite beam ...

delaminated layers in the free vibrational analysis, Luo and Hanagud [7] presented an analytical model based on the Timoshenko beam theory by using the piecewise-linear springs. In their work, the spring stiffness would then be equal to zero (0) for the free mode and infinity (∞) for the constrained mode. Moreover, the effect of coupling

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Forced vibration of delaminated Timoshenko beams under the ...

Abstract. This paper is concerned with long-time dynamics of laminated beams modeled from the well established Timoshenko system. Of particular interest is a model of two-layered beam proposed by Hansen and Spies which describes the slip effect produced by a thin adhesive layer uniting the structure. In a more general setting, involving a nonlinear foundation, we establish the existence of smooth finite dimensional global attractors for the corresponding solution semigroup.

Dynamics of Laminated Timoshenko Beams | SpringerLink

Dynamics of a Delaminated Timoshenko Beam Subjected to a Moving Oscillatory Mass Mechanics Based Design of Structures and Machines, Vol. 40, No. 2 NUMERICAL AND EXPERIMENTAL STUDY ON FREE VIBRATION OF DELAMINATED WOVEN FIBER

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GLASS/EPOXY COMPOSITE PLATES

Free vibrations of delaminated beams | AIAA Journal

the free vibration analysis of delaminated composite beams based on the Timoshenko and Bernoulli-Euler beam theories [31]. In this study, it was shown that the delaminated beam vibration is a coupled exural-longitudinal vibration, and the delamination opening is due to the dynamic buckling phenomenon. Furthermore, Szekr enyes [32] also presented a nite-

Bending and vibration analysis of delaminated Bernoulli

...

The Timoshenko-Ehrenfest beam theory was developed by Stephen Timoshenko and Paul Ehrenfest early in the 20th century. The model takes into account shear deformation and rotational bending effects, making it suitable for describing the

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behaviour of thick beams, sandwich composite beams, or beams subject to high-frequency excitation when the wavelength approaches the thickness of the beam.

Timoshenko-Ehrenfest beam theory - Wikipedia

Recently, Kargarnovin et al. have been studying the dynamic response of the delaminated Timoshenko beam based on the constrained mode model under the action of moving force [23-25] and moving oscillatory mass [26, 27] in which the bending-tension coupling has been ignored.

Dynamics of a generally layered composite beam with single ...

Delaminations not only affect the strength of the structure by contributing to its final failure but also cause a reduction in the stiffness, thus affecting its dynamic characteristics. In particular, delaminations reduce the natural frequency, which may cause

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resonance if the reduced frequency is close to the working frequency.

Analytical Solution for the Free Vibration Analysis of ...

This paper is concerned with the dynamic response of a nonuniform Timoshenko beam with elastic supports subjected to a moving spring-mass system. The modal orthogonality of nonuniform Timoshenko beams and the corresponding overall matrix of undetermined coefficients are derived. ... Dynamics of a delaminated Timoshenko beam subjected to a ...

Dynamic Response of a Nonuniform Timoshenko Beam with ...

This work presents a method to find the exact solutions for the free vibration analysis of a delaminated beam based on the Timoshenko type with different boundary conditions. The solutions are obtained by the method of Lagrange multipliers in

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which the free vibration problem is posed as a constrained variational problem. The Legendre orthogonal polynomials are used as the beam eigenfunctions.

Analytical Solution for the Free Vibration Analysis of ...

Lee, D. Kim and I. Park, Dynamic modeling and analysis of the PZT-bonded composite Timoshenko beams: Spectral element method, J. Sound. Vibr. 332 (6) (2013) 1585-1609. Crossref , ISI , Google Scholar

Longitudinal and Transverse Coupling Dynamic Properties of ...

Free vibration of functionally graded beams with a through-width delamination is investigated. It is assumed that the material property is varied in the thickness direction as power law functions and a single through-width delamination is located parallel to the beam axis. The beam is subdivided into three

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regions and four elements. Governing equations of the beam segments are derived based on ...

Free vibration of FGM Timoshenko beams with through-width ...

ABSTRACT: In this work, large amplitude vibrations of a heated Timoshenko composite beam having delamination is studied. The model of delamination considers the contact interaction between sublaminates including normal forces, shear forces and additional damping due to the sublaminate interaction.

LARGE AMPLITUDE VIBRATIONS OF TIMOSHENKO BEAMS WITH ...

Dynamics of a delaminated Timoshenko beam subjected to a moving oscillatory mass. MH Kargarnovin, MT Ahmadian, RA Jafari-Talookolaei. Mechanics based design of structures and machines 40 (2), 218-240, 2012, 24: 2012: Dynamics of a

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laminated composite beam on Pasternak-viscoelastic foundation subjected to a moving oscillator.

Ramazan-Ali Jafari-Talookolaei - Google Scholar

Dynamics of a delaminated Timoshenko beam subjected to a moving oscillatory mass. Mech Based Des Struct Mach 2012; 40: 218 ...

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