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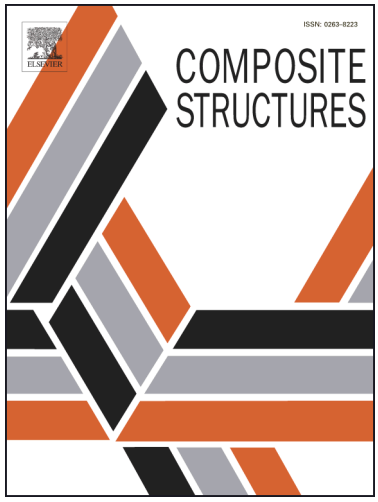

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PII: S0263-8223(17)31110-8
DOI: http://dx.doi.org/10.1016/j.compstruct.2017.07.038
Reference: COST 8693

To appear in: *Composite Structures*

Received Date: 5 April 2017
Revised Date: 20 May 2017
Accepted Date: 13 July 2017

Please cite this article as: Youzera, H., Meftah, S.A., Nonlinear damping and forced vibration behaviour of sandwich beams with transverse normal stress, *Composite Structures* (2017), doi: http://dx.doi.org/10.1016/j.compstruct.2017.07.038

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Nonlinear damping and forced vibration behaviour of sandwich beams with transverse normal stress.

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Abstract:

This paper deals with the nonlinear forced vibration analysis of sandwich beam with viscoelastic core layer. In the analytical formulation, normal, transverse and shear deformations are considered in the core layer by mean of the refined higher-order zig-zag theory. The harmonic balance method for a doubly supported beam is adopted as a solution procedure. Thus, the obtained nonlinear frequency amplitude equation is governed by several complex parameters. These ones are arising for the geometrically non-linear coupling due to the viscoelastic layer core. The frequency response curves are presented and discussed by varying the material and geometric properties of the viscoelastic layer.

Keywords: Sandwich beam; Viscoelstic material;; Higher order shear theories, Zig zag theories; Damping properties., nonlinear vibrations.

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