ACADEMIC PRESS

Available online at www.sciencedirect.com

SCIENCE DIRECT

Journal of Sound and Vibration 264 (2003) 982

JOURNAL OF SOUND AND VIBRATION

www.elsevier.com/locate/jsvi

Author's reply ☆

W.O. Wong

Department of Mechanical Engineering, The Hong Kong Polytechnic University, Hung Hon, Hong Kong

Received 4 October 2002; accepted 11 October 2002

The author thanks Drs. Vera and Laura for their comments on the paper [1]. For an isotropic rectangular plate of uniform thickness h, the modulus E and the Poisson ratio v are constant with respect to time t and the spatial variables x and y. It may be better to put the constant factor before the differential operators and to rewrite Eq. (1) of Ref. [1] as

$$\left[\frac{Eh^3}{12(1-v^2)}\right]\nabla^4 w(x,y,t) + \rho h\,\frac{\partial^2 w(x,y,t)}{\partial t^2} = 0. \tag{1}$$

The mass loaded subdomain as shown in Fig. 1 is $(x_c - d_x/2) < x < (x_c + d_x/2)$ and $(y_c - d_y/2) < y < (y_c + d_y/2)$.

The dynamic equation of the unloaded portion of the plate as mentioned in Ref. [1] is described by Eq. (1) while that of the mass loaded portion is described by Eq. (2) in Ref. [1]. To prevent any confusion, Eq. (2) in Ref. [1] can be rewritten as

$$D\nabla^4 w(x,y,t) + \rho h\,\frac{\partial^2 w(x,y,t)}{\partial t^2} = 0 \quad \text{for the unloaded portion,} \tag{2a}$$

$$D\nabla^4 w(x,y,t) + \rho h\,\frac{\partial^2 w(x,y,t)}{\partial t^2} + \frac{\partial^2 (MA' w(x,y,t))}{\partial t^2} = 0 \quad \text{for the loaded portion,} \tag{2b}$$

where $D = Eh^3/12(1-v^2)$ is the flexural rigidity of the plate.

Although Eq. (2) of Ref. [1] can be corrected by using the Heaviside's step function in the x and y directions [2] as suggested by Vera and Laura, it seems simpler to express Eq. (2) by two equations as stated above. The above changes should not affect any results presented in Ref. [1] because those numerical results are calculated based on Eq. (7) of Ref. [1].

References

[1] W.O. Wong, The effects of distributed mass loading on plate vibration behavior, Journal of Sound and Vibration (2002) 577–583.

[2] O. Kopmaz, S. Telli, Free vibrations of a rectangular plate carrying a distributed mass, Journal of Sound and Vibration 251 (2002) 39–57.

☆ Reply to doi: 10.1016/S0022-460X(02)01465-7.

E-mail address: mmwowong@polyu.edu.hk (W.O. Wong).

0022-460X/03/$ - see front matter © 2003 Elsevier Science Ltd. All rights reserved.

doi:10.1016/S0022-460X(02)01466-9