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Letter to the Editor

# Comments on "The effects of distributed mass loading on plate vibration behavior"

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As stated by Wong [1], distributed mass loading can induce significant changes of natural frequencies and modal shapes of vibrating structural elements. The analysis presented in Ref. [1] assumes that the mass: (1) does not prevent any bending of the plate, (2) it is rigidly attached to the plate, and (3) it does not provide or possess strain energy.

Unfortunately, Eq. (2) is not correct since the third term applies only to the mass-loaded portion. It could be included using Heaviside's step function in the $x$ and $y$ directions. According to Fig. 1 the mass-loaded subdomain is $A' = d_x \times d_y$ instead of $x_x \times y_c$ as stated by the author, since $x_c$, $y_c$ are the co-ordinates of the center of gravity of the subdomain.

The above does not alter the numerical results which appear to be correct.

It is also felt that the notation used in Eq. (1) is not convenient since the classical equation

$$D\nabla^4 w + \rho h \frac{\partial^2 w}{\partial t^2} = 0$$

is applicable when the thickness of the plate, $h$, is constant. It does not appear convenient to include the flexural rigidity $D = Eh^3/12(1 - \nu^2)$ inside the differential operator. Admittedly these are minor points but may lead to confusion of the inexperienced reader or the professional engineer.

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## References

[1] W.O. Wong, The effects of distributed mass loading on plate vibration behavior, Journal of Sound and Vibration 252 (2002) 577–583.

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