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LETTERS TO THE EDITOR

COMMENTS ON "TRANSIENT AXISYMMETRIC STRESS WAVE PROPAGATION IN WEAKLY COUPLED LAYERED STRUCTURES"

M. EL-RAHEB

Dow Chemical, Ceramics Lab., Midland, MI 48674, *U.S.A.*

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The trapezoidal forcing function shown in Figure 3(a) of reference [1] has a duration of 7·5 μs. However, transient stress histories in Figures 16–19 show that the response pulse of first arrival (before any reflections occur) has a width of approximately 20–25 μs. This indicates that the response is inconsistent with the time interval of the forcing function. The authors must have used a different forcing function than the one shown in Figure 3(a) to perform the numerical calculations.

Also, Figures 16 and 18 indicate that during first arrival, results from the integral method have a magnitude *smaller* than results from the finite element analysis and not *larger*. This contradicts the statement in the third paragraph of page 410: "In early times, the maximum stress values for σ_{zz} of the integral transform results are generally approximately 5% larger than those of the finite element analysis". This sentence should be rectified.

Finally, dispersion lines of "k" versus "ω" in Figures 4 and 5 show that lines corresponding to different modes cross. This is inconsistent with the linearity of the problem which requires solutions to be unique; i.e., the dynamical system cannot assume two different states at the same frequency. In fact, these lines approach each other but never cross. This "almost coalescence" is characteristic of other problems in linear dynamics and acoustics. A note on this important issue is necessary for clarity.

REFERENCE

1. C. CETINKAYA and A. VAKAKIS 1996 *Journal of Sound and Vibration*, **194**, 389–416. Transient axisymmetric stress wave propagation in weakly coupled layered structures.

AUTHORS' REPLY

C. CETINKAYA AND A. VAKAKIS

Wolfram Research, Inc. and University of Illinois at Urbana-Champaign, IL, U.S.A.

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The duration of the applied force used in the numerical calculations is 25 μs as opposed to what is shown in Figure 3(a) of the published paper. Apparently, this misunderstanding comes from an error made in the artwork during the typesetting. We suspect that the error was introduced when these plots were regenerated by the publishers, since the x-axes of Figures 2(a) and 3(a) are the same, while the original Figure 3(a), Figure 1 here, shows that the original plot was correct.

As for the remark related to the statement "In early time, the maximum stress values for σ_{zz} of the integral transform results are generally approximately 5% larger than those

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of the finite element analysis", the authors agree that this statement must be rectified by replacing the word "smaller" with "larger", as clearly seen in the paper. (Figures 16 and 18).

The crossing of the lines defining the boundary between propagation zones and attenuation zones simply means that the two stress modes (for two independent components of the stress tensor σ_{zz} and σ_{zr}) of motion at the crossing frequency propagate at the same radial wavenumber. Since this point is carefully highlighted in reference [2] of the paper, which is antecedent of the current work, the authors used the propagation zones of the systems considered in this paper for only determining the integration domains for the numerical simulations. From the axisymmetric nature of the problem under investigation, it is only natural to expect that in the layered structures there are two independently propagating components of the stress tensor. Therefore these crossings do not form an argument against the physical consistency of the analysis.

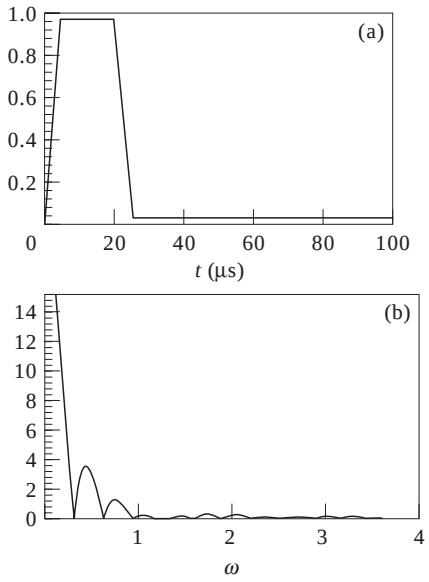

Figure 1. The time component of the applied pressure field: (a) function $f_2(t)$ versus time; (b) the power spectrum of $f_2(t)$.