Appendix III

The relation between Konno's α_1 [10], [11], and Ω in this paper is as follows.

$$\Omega = \alpha_1^4 \frac{16 r_c^2 r_h^2 r_{hL}^2 \{1 + 3(1/r_h) + 3(1/r_h)^2 + (1/r_Y)(1/r_h)^3\}}{3 r_l^4 \{1 + (1/r_\rho)(1/r_h)\}} \tag{37}$$

where

$$r_c^2 = \frac{c_t^2}{c_m^2} = \frac{Y_t/\rho_t}{Y_m/\rho_m}$$

$$r_l = l_t/L.$$

References

[1] K. Yakuwa and S. Okuda, "Miniaturisation of the mechanical vibrator used in an electromechanical filter," 6th International Congress on Acoustics, Tokyo, Japan, August 21-28, 1968, G-3-5.

[2] W. P. Mason and R. N. Thurston, "A compact electromechanical bandpass filter for frequencies below 20 kilocycles," *IRE Trans. Ultrasonics Engineering*, vol. UE-7, pp. 59-70, June, 1960.

[3] T. Okamoto, K. Yukawa, and S. Okuda, "Low frequency electromechanical filter," *FUJITSU Sci. Tech. J.*, pp. 53-86, May 1966.

[4] For example, W. P. Mason *Electromechanical Transducer and Wave Filters*," 2nd ed. New York: Van Nostrand, 1948.

[5] S. Ikeno, "A design theory of distributed constant filters," *J. Inst. Elect. Comm. Engrs. Japan*, vol. 35, no. 12, p. 544, 1952.

[6] T. E. Shea, *Transmission Networks and Wave Filters*." New York: Van Nostrand, 1929.

[7] J. I. Potter and S. Fisk, *Theory of Networks and Lines*. Princeton, N. J.: Prentice-Hall, 1963.

[8] M. Konno and H. Nakamura, "Equivalent electrical network for the transversely vibrating uniform bar," *J. Acoust. Soc. Am.*, vol. 38, no. 4, pp. 614-622, 1965.

[9] H. Nakamura and M. Konno, "Resonant frequency of a stepped-cantilever," *J. Acoust. Soc. Japan*, vol. 21, no. 2, pp. 55-64, 1965.

[10] C. Kusakabe, M. Konno, and Y. Tomikawa, "Resonant frequencies of transversely vibrating bar excited by electrostrictive transducer," *J. Inst. Elect. Comm. Engrs. Japan*, vol. 48, no. 11, pp. 150-155, 1965.

[11] C. Kusakabe and M. Konno, "Vibration modes of transversely vibrating bar excited by electrostrictive transducer," *J. Inst. Elec. Comm. Engrs., Japan*, vol. 49, no. 12, pp. 42-47, 1966.

[12] J. B. Vernon, *Linear Vibration Theory—Generalised Properties and Numerical Methods*. New York: Wiley, 1967.

[13] O. C. Zienkiewicz and Y. K. Cheung, *The Finite Element Method in Structural and Continuum Mechanics*. London: McGraw-Hill, 1966.

[14] J. M. Prentis and F. A. Leckie, *Mechanical Vibrations—An Introduction to Matrix Methods*. London: Longmans, 1963.

[15] F. A. Leckie and G. M. Lindberg, "The effect of lumped parameters on beam frequencies," *Aeron. Quart.*, pp. 224-240, August 1963.

[16] Y. Y. Yu, "Flexural vibrations of elastic sandwich plates," *J. Aero/Space Sci.*, vol. 27, no. 4, pp. 272-283, 1960.

[17] D. Berlincourt, B. Jaffe, H. Jaffe, and H. H. A. Krueger, "Transducer properties of lead titanate zirconate ceramics," *IRE Trans. Ultrasonics Engineering*, vol. UE-6, pp. 1-6, February 1960.

[18] G. M. L. Gladwell, "Variational calculation of the impedance of a lossy, non-uniform mechanical transmission line," *J. Sound and Vibration*, vol. 7, no. 2, pp. 200-219, 1968.

[19] H. Nukiyama, *Study on Electroacoustical Devices*. Tokyo, Japan: Maruzen Book Co., March 1948.

Corrections

Acoustoelectric Effects in Semiconducting Transducers[1]

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Equations (14) and (15) on page 46 should read:

$$\sum \left(1 + \frac{e^2}{\epsilon c} - \frac{\omega^2}{v_s^2 k_i^2}\right) k_i^2 \beta_i = 0 \tag{14}$$

$$\sum \left(1 + \frac{e^2}{\epsilon c} - \frac{\omega^2}{v_s^2 k_i^2}\right) k_i^2 \beta_i^2 \exp(i k_i L) = 0. \tag{15}$$

[1] *IEEE Trans. Sonics and Ultrasonics*, vol. SU-16, pp. 45-48, April 1969.

Current Saturation and Oscillations in Piezoelectric Semiconductors Due to the Acoustoelectric Effects[1]

HALVOR SKEIE

Page 137, (3) should read

$$\frac{dW}{dt} = \frac{\partial W}{\partial t} + v_s \frac{\partial W}{\partial t} = I_s E_{ae}.$$

Page 137, (5) should read

$$E = v_d/\mu + \alpha W_0/\rho \cdot \exp \int_0^x \alpha \, dx.$$

Page 137, in the line following (8) should read

$$v_d = \int \rho v \, dx \bigg/ \int \rho \, dx = v_s.$$

Page 138, the first equation should read

$$v_d = \int \rho v \, dx \bigg/ \int \rho \, dx.$$

Page 138, in the fourth paragraph, first column, should read $\gamma = \mu E_t/v_s - 1$ instead of $\gamma = v_d/v_s - 1$.

Page 138, (12) should read

$$(v_0 - v_s)\rho_t + \rho_0 v_t + \sum_{n,m} v_n \rho_m = 0.$$

Page 138, (14) should read

$$v_0 = \int v \, dx \bigg/ \int dx = \mu E_t = v_d + \mu E_{ae}.$$

Page 138, (15) should read

$$\gamma = \mu E_t/v_s - 1.$$

Page 138, (18) should read

$$k = \partial\alpha/\partial v_d.$$

Page 139, (20) should read

$$Z = R_0 + R_{0A} k W_{0A} \mu_A/\rho_A \cdot [1/(\alpha q L) + 1/(j\beta_s q L) + C/[j\beta_s L(\alpha - j\beta_s)] \cdot \exp(-j\beta_s q L)].$$

Page 140, (25) should read

$$\gamma = v_d/v_s - 1 + \mu\alpha W/I_s.$$

Page 140, (28b) should read

$$\gamma' = \gamma_0'/2[1 + |2/\gamma'| \sqrt{(\gamma_0'/2)^2 + W''}].$$

[1] *IEEE Trans. Sonics and Ultrasonics*, vol. SU-16, pp. 136–144, July 1969.

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