experiment with the predictions of (2) and (3) for $\delta = 0$ and $N = 0.9$, corresponding to $f_r = 105.5$ MHz and $f_0 = 104.5$ MHz in (2). For $B_1 = 0$ the transducer is highly reflecting with a transmission loss of 35 dB and reflection loss of zero dB within the $\pm 0.25$ dB measurement accuracy. The transmission loss of 35 dB corresponds to a load conductance of $Re\, Y_L = 10^{-4}$ mhos, or a circuit $Q$ of 40. This value is consistent with the estimated loaded $Q$ of the electrically resonant transducer at $f = 105.5$ MHz.

Fig. 3 compares the results of the second experiment with the predictions of (2) through (4) for $\delta = 0$ and $N = 0.9$. In both cases experiment and theory are in close agreement. Thus, it is clear that the disagreement found in [1] is a result of making the assumption $\delta = 0$.

CONCLUSIONS

The agreement between theory and experiment in Figs. 2 and 3 adds further support to the validity of the equivalent circuit model presented in [1]. Note that the scattering characteristics provide a sensitive experimental tool for determining the acoustic synchronous frequency. Moreover, the scattering characteristics of the ID transducer suggest interesting device applications. The highly reflecting transducer provides a novel technique for efficient reflection of surface acoustic waves. It has been used as a parasitic element in the fabrication of a highly directional surface wave transducer [5] and might be employed in the design of surface wave switches, filters, and resonators. Fig. 3 shows that with properly designed electrical loading, a tradeoff of insertion loss versus the level of the reflected signal can be achieved. This may be of importance in the design of multiple tapped delay lines where high echo suppression is necessary and weak tapping can be tolerated. It is also worth noting that the total scattered surface wave power measured was equal to the incident power to within an experimental accuracy of 10 percent. This indicates that no appreciable mode conversion to bulk waves or off-axis surface waves occurs at the scattering transducer.

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REFERENCES


Correction to "Exact Solutions of Stepped Impedance Transformers Having Maximally Flat and Chebyshev Characteristics"

In (15) of the above paper, page 380, the term in the denominator outside the bracket should have read $2\sqrt{R}$.

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