Taking the natural logarithm of both sides,

\[ z = \frac{h}{2\pi} \ln \left( \frac{(1 + A)^2 + B^2}{(1 - A)^2 + B^2} \right) + i \frac{h}{\pi} \arctan \left( \frac{2B}{1 - A^2 - B^2} \right). \]

Equating real and imaginary parts on both sides, we obtain

\[ x = \frac{h}{2\pi} \ln \left( \frac{(1 + A)^2 + B^2}{(1 - A)^2 + B^2} \right) \tag{5} \]

and

\[ y = \frac{h}{\pi} \arctan \left( \frac{2B}{1 - A^2 - B^2} \right). \tag{6} \]

Thus, we see that an important factor of half is missing from the \( x \)-coordinate expression given by Gillick et al. Furthermore, the field plots given show only a qualitative picture of the \( E \)- and \( H \)-field patterns inside the substrate of CBCPW, and according to the analysis, there is a significant dependence of the field plots on the CPCPW geometry. Hence, the plots in this paper lack a proper qualitative picture, i.e., dimensional labeling. One important point is that the inclusion of the factor 1/2 as pointed out above will cause the complete \( E \)- and \( H \)-field patterns inside the substrate to shrink towards \( x = 0 \) from both \( x \) directions.

In light of the above analysis, we feel that the field plots inside the substrate given by Gillick et al. are spread out more in the \( x \) direction than they actually should be. Also, we seriously feel that this type of analysis which gives the \( x \)-\( y \) coordinates of field plots inside the substrate does call for a proper dimensional labeling of the structure.

Comments on “Picosecond Pulse Propagation on Coplanar Stripes Fabricated on Lossy Semiconductor Substrates: Modeling and Experiments”

George C. Giakos and T. Koryu Ishii

The objective of this correspondence is to point out that the propagation of picosecond pulse with superluminal speed has been reported in [1]. The propagation speed of the pulse peaks was calculated from Fig. 1(a) and (b) of [1]. The results of our observations are tabulated in Tables I and II. In these tables, the departure time and arrival time of the pulses were read from Fig. 1(a) and (b) of [1].
TABLE I

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TABLE II

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</table>

As seen from Tables I and II, the speeds of pulse peaks are superluminal.

REFERENCES


Reply to “Comments on ‘Picosecond Pulse Propagation on Coplanar Striplines Fabricated on Lossy Semiconductor Substrates: Modeling and Experiments’”


While the computations in [1] which use the data in [2, Figs. 1(a) and (b)], to determine the propagation velocities of the pulse peaks are correct, we believe that the speeds tabulated in [1] are greater than that of light in vacuum due to a misunderstanding resulting from an omitted statement in [2] and not to any new physical phenomena. That is, an unfortunate oversight in [2] has led to the illusion that there is pulse propagation at a velocity greater than that of the speed of light. In Fig. 1 [2], it should have been noted in the caption for both parts (a) and (b) that the delays of the waveforms have been artificially decreased so that they would all fit within the same 12-ps time window. Squeezing the delays so that the waveforms were closer than the actual calculations indicated has allowed reasonably subtle pulse-width variations and other features to be more easily discerned. This compression of the delays has thus been carried out for the purpose of enhancing the observation of distortion effects. If the true, larger time window had been used, the input, for instance, would have appeared essentially as a delta function, and the pulses would have appeared quite similar to each other.

In the previous papers, such as the one by Gupta et al. [3], we have specifically stated that the actual delays are different than those shown. Since this qualifier was not added in [2], the approximate actual delays of the peaks are provided here as follows: for 0.2 mm propagation, the true delay is ~2.2 ps; 0.5 mm, ~5.5 ps; 1.0 mm, ~10.5 ps; 2.0 mm, ~19.7 ps; 3.0 mm, ~28.8 ps. The true delays are essentially the same for Figs. 1(a) and (b), and the pulse shapes in Fig. 1 are not affected by the shifting.

The authors regret the omission of the statement that was essential for clarification, and apologies are extended for the misunderstanding that has occurred.

REFERENCES


Correction to “A New Aperture Admittance Model for Open-Ended Waveguides”

S. S. Stuchly

In the above paper, there was a mistake in the sequence of authors in the by-line. The by-line would read as follows: C. L. Sibbald, S. S. Stuchly, Fellow, IEEE, and J. M. Anderson.

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