Letters

Comments on "SPICE-Compatible Models for Multiconductor Transmission Lines in Laplace-Transform Domain"

José M. Gómez and José I. Alonso

The above paper[1] presents two equivalent models compatible with SPICE for multiconductor transmission lines that permit us to analyze the time-domain response of this kind of structures.

One model employs a Thévenin equivalent circuit and the other model is based on a hybrid model. Both models use mode decoupling in the frequency and contain controlled sources in the Laplace-transform domain. The above-mentioned technique allows us to handle lossy lines with frequency-dependent parameters.

A misprint has been detected in the above paper.[1] More specifically, in Fig. 2 of the above paper,[1] where a SPICE-compatible model based on the Thévenin equivalent circuit for $N = 3$ is described.

If we focus on the expressions contained in the central part of the equivalent circuit shown in the above-mentioned figure, where the voltage-controlled voltage sources are shown within the Laplace-transform domain that represent the intensities of propagated modes, typographical errors can be found in each control variable of these voltage sources.

For example, the following expression appears in the first generator:

$$\sum_{i=1}^{3}\Big(S'_{V1i}V_i(D) - G_{\rm incl}(D)\Big)e^{-\gamma_1 D}$$

whereas the correct expression should have been formulated as follows:

$$\left(\sum_{i=1}^{3}\Big(S'_{V1i}V_i(D)\Big) - G_{\rm incl}(D)\right)e^{-\gamma_1 D}.$$

We were able to notice that the running sum does not affect $G_{\rm incl}(D)$, as it was stated in the incorrect expression. This error appears in each control variable of voltage sources found in the middle of the developed model of Fig. 2 in the above paper.[1]

The error is easy to detect if we follow (1)–(13) in the above paper,[1] which generate the proposed circuit configuration.

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[1] A. R. Djordjević, *IEEE Trans. Microwave Theory Tech.*, vol. 45, no. 5, pp. 569–579, May 1997.

Author's Reply

Antonije R. Djordjević

I want to sincerely thank J. M. Gómez and J. I. Alonso for their careful reading of the above paper.[1] The error pointed out by them does indeed exist, and it is almost obvious: the first left bracket should be just before the sum. Hence, the first expression should read

$$\left(\sum_{i=1}^{3}S'_{V1i}V_i(D) - G_{\rm incl}(D)\right)e^{\gamma_1 D}.$$

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[1] A. R. Djordjević, *IEEE Trans. Microwave Theory Tech.*, vol. 45, no. 5, pp. 569–579, May 1997.

Comments on "Application of a Coupled-Integral-Equations Technique to Ridged Waveguides"

Debatosh Guha and Pradip Kumar Saha

In the above paper,[1] a new technique has been applied to analyze a single-ridge waveguide in which the ridge can be placed symmetrically or asymmetrically on a broad wall of the guide. The dimensional parameters of the cross-sectional geometry (Fig. 1 in the above paper[1]), however, do not agree with some statements as well as the interpretation in Section VI in the above paper.[1]

In the first paragraph of Section VI in the above paper,[1] the condition for the symmetric ridge has been mentioned as $l_1 = l_2 = a$. However, this condition for Fig. 1 in the above paper[1] should be $l_1 = l_2 = a - s$. Moreover, in connection with Fig. 4 in the above paper,[1] it has been stated in the same section that "the cutoff wavenumber obtained when $l_1/a = 1$ is identical to that given in Table I." Here also, "$l_1/a = 1$" should be replaced by $l_1/a = 1 - s/a$ for a symmetrically placed ridge. This leads to possible misinterpretation of results presented in Fig. 4 in the above paper[1] for $l_1/a = 1$. For a symmetrically placed ridge, $l_1/a = 1$ when $s = 0$, but $l_1/a < 1$ for a practical ridge with $s > 0$.

A TE-mode analysis of a similar structure was carried out by us by applying the Ritz–Galerkin technique with similar domain decomposition, as in Fig. 1(b), in the above paper[1], and the dominant

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[1] S. Amari, J. Bornemann, and R. Vahldieck, *IEEE Trans. Microwave Theory Tech.*, vol. 44, no. 12, pp. 2256–2264, Dec. 1996.

TABLE I
CUTOFF WAVENUMBERS OF THE DOMINANT MODE IN A SINGLE-RIDGE WAVEGUIDE FOR DIFFERENT LOCATIONS OF THE RIDGE (DIMENSIONAL PARAMETERS AS IN FIG. 4 IN THE ABOVE PAPER)

s mm	l_1/a	k_c (rad / mm) Present method	From Fig.4[1]
2.4	1.4	0.1244	0.123
	1.2	0.0915	0.091
	1.0	0.0801	0.080
	0.747 (symmetric ridge)	0.0761	–
1.2	1.6	0.1253	0.124
	1.4	0.0989	0.098
	1.2	0.0876	0.087
	1.0	0.0828	0.083
	0.874 (Symmetric ridge)	0.0820	–

mode k_c values were calculated for different l_1/a values. The results for two ridge widths presented in Table I show excellent agreement with the results read from Fig. 4 in the above paper[1] for $l_1/a \geq 1$. However, the present results also indicate that the minimum value of k_c occurs not at $l_1/a = 1$, but at $l_1/a = 1 - s/a$, i.e., for a symmetrically located ridge, though, as expected, the associated error is not significant for a very thin ridge.

Authors' Reply

S. Amari, J. Bornemann, and R. Vahldieck

We thank Guha and Saha for their comments on the above paper.[1] They are correct in stating that the ridge is symmetric when $l_1/a = 1 - s/a$ and not $l_1/a = 1$, as stated in the above paper.[1] The numerical results reported in Fig. 4 are, however, accurate, as the independent calculations of Guha and Saha's comments show. We indeed calculated the cutoff wavenumbers when the ridge is symmetric, but the corresponding values were not reported in Fig. 4 of the above paper.[1] We recalculated the entries in Guha and Saha's Table I using the method in the above paper.[1] The results, presented as follows in Table I, show that there is no discrepancy between the two calculations for all values of l_1/a, including when the ridge is symmetric.

We again thank Guha and Saha for pointing out this oversight.

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[1]S. Amari, J. Bornemann, and R. Vahldieck, *IEEE Trans. Microwave Theory Tech.*, vol. 44, no, 12, pp. 2256–2264, Dec. 1996.
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TABLE I
K_c (rad/mm) OF THE DOMINANT MODE IN A SINGLE-RIDGE WAVEGUIDE VERSUS l_1/a.

s(mm)	l_1/a	k_c(rad/mm) [1]	k_c(rad/mm) [2]
2.4	1.4	0.1241	0.1244
	1.2	0.0914	0.0915
	1.0	0.0801	0.0801
	0.747	0.0761	0.0761
1.2	1.6	0.1253	0.1253
	1.4	0.0989	0.0989
	1.2	0.0876	0.0876
	1.0	0.0828	0.0828
	0.874	0.0820	0.0820

[1]Method of reference of the above paper.
[2]Guha and Saha's comments.

Comments on "Characterization of High-Q Resonators for Microwave-Filter Applications"

Z. Wu and L. E. Davis

We read, with interest, the above paper,[1] in which the authors described the measurement method of the unloaded Q-factor of a one-port coupled resonator to be "unique," "original," and "The method we developed." We have, however, noticed that the method described in the above paper[1] is one of the six methods described in [1, Sec. 3.1]. The generalized loaded Q, i.e., $QL(x, b)$, defined in the above paper[1], is noted as Qa in [1]. Also, (3) and (4) in the above paper[1] are identical to (9a) and 9(c) in [1]. Reference [1] is not cited by the authors in the above paper.[1]

We welcome a response from the authors of the above paper[1] regarding our comments.

REFERENCES

[1] Z. Wu and L. E. Davis, "Automation-orientated techniques for quality-factor measurements of high-Tc superconducting resonators," *Proc. Inst. Elect. Eng.*, vol. 141, no. 6, pp. 527–530, Nov. 1994.

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[1]R. S. Kwok and J.-F. Liang, *IEEE Trans. Microwave Theory Tech.*, vol. 47, no. 1, pp. 111–114, Jan. 1999.

Authors' Reply

Raymond S. Kwok and Ji-Fuh Liang

In the above paper,[1] a one-port unloaded Q measurement procedure was derived from a standard equivalent circuit, which was almost identical to that used in [1]. Consequently, (4) in the above paper[1] is the same as [1, eq. (9c)].

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[1] R. S. Kwok and J.-F. Liang, *IEEE Trans. Microwave Theory Tech.*, vol. 47, no. 1, pp. 111–114, Jan. 1999.

Our main purpose of the first half of the above paper[1] was to provide a simple formula to calculate the unloaded Q as a function of measurable quantities only. (Note that the coupling coefficient β is not in the final equation (6) of the above paper[1]). The first portion of the above paper[1] was then concluded with a three-easy-steps procedure to measure unloaded Q with a single reflection measurement.

Nevertheless, the authors of the above paper[1] apologize for not being aware of the contribution of Wu and Davis in the Q measurement techniques, and agree that [1] should have been acknowledged in the above paper.[1]

References

[1] Z. Wu and L. E. Davis, "Automation-oriented techniques for quality-factor measurements of high-Tc superconducting resonators," *Proc. Inst. Elect. Eng.*, vol. 141, pp. 527–530, Nov. 1994.