Letters

Corrections to "Electromagnetic Field Plot of an Inductive Window by the Moment Method"

John R. Natzke, Mark R. Wolski, and Thomas Koryu Ishii

The above paper[1] contains three errors. Equation (5) should read:

$$G_{iy}^{y}(\bar{r}/\bar{r}_i) = \frac{-j}{ab}\sum_{m,n}\left\{\frac{2-\delta_o}{k_c^2 k_z}\left[\left(\frac{m\pi}{a}\right)^2 - \frac{k_z^2}{k^2}\left(\frac{n\pi}{b}\right)^2\right]\right.$$
$$\cdot \sin\frac{m\pi x}{a}\cos\frac{n\pi y}{b}\sin\frac{m\pi x_i}{a}\cos\frac{n\pi y_i}{b}$$
$$\left.\cdot \exp\left(-jk_z|z-z_i|\right)\right\} \quad (5)$$

Equation (6) should read:

$$A_{iy}^{y}(m) = \frac{1}{ab\sqrt{\left(\frac{m\pi}{a}\right)^2 - k^2}} \quad (6)$$

Finally, one line above (12) should read:

from the S matrix as follows [7]:

Manuscript received December 13, 1991.

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IEEE Log Number 9107027.

[1] J. R. Natzke, M. R. Wolski, and T. K. Ishii, *IEEE Trans. Microwave Theory Tech.*, vol. 39, no. 8, pp. 1296–1300, Aug. 1991.

Comments on "Whispering Gallery Dielectric Resonator Modes for *W*-Band Devices"

M. J. Niman

The above paper[1] is a valuable contribution to a field which has little coverage in the literature. Working through the results however, it is felt that a discrepancy exists which may mislead other workers in this subject. In this regard, Section II-D and Fig. 6 which discuss a measurement in the 75–110 GHz band, raise most concern. In the paper the resonances on the plot (reproduced in Fig. 1) are attributed to whispering gallery (WG) modes $WGE_{6\text{-}10,0,0}$ and $WGH_{6\text{-}10,0,0}$ for an alumina resonator of 5 mm diameter and 0.635 mm high. Verifying this performance with our own analysis software which is based on Wait [1] and Arnaud [2] strongly suggests that in fact a set of higher order radial modes are being measured: $WGE_{6\text{-}10,1,0}$ and $WGH_{6\text{-}10,1,0}$.

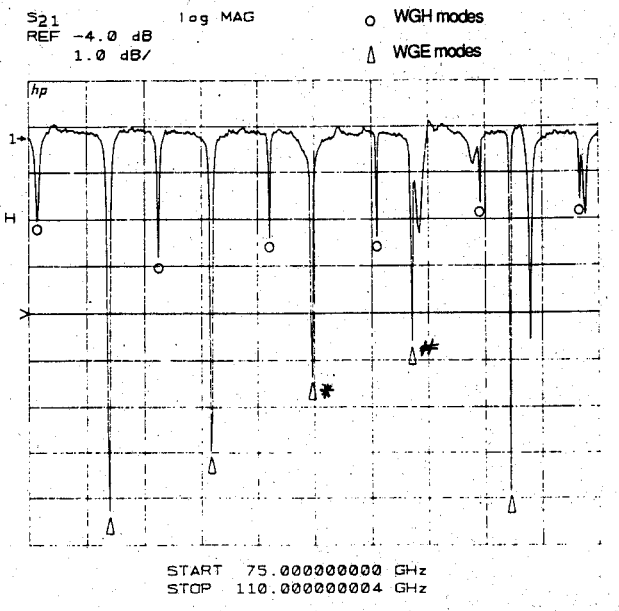

Fig. 1. Measurement of whispering gallery mode resonator (reproduced from Fig. 6 in the Cros and Guillon paper).

TABLE I
COMPARISON BETWEEN PUBLISHED DATA AND THEORETICAL CALCULATIONS

	Current Work (Theoretical)				Published (Measured)	
n	$WGH_{n,0,0}$	$WGE_{n,0,0}$	$WGH_{n,1,0}$	$WGE_{n,1,0}$	$WGH_{n,0,0}$	$WGE_{n,0,0}$
6	52.824	59.324	74.158	80.602	75.46	79.88
7	59.975	66.424	81.910	88.443	82.83	86.05
8	67.022	73.426	89.518	96.079	89.74	92.35
9	73.990	80.358	97.005	103.546	96.28	98.48
10	80.893	87.218	104.392	110.919	102.72	104.57
11	87.740	94.037			108.89	
12	94.550	100.819				
13	101.317	107.546				
14	108.049	114.252				

The results of our own analysis along with the published results are given in Table I. Since it was not stated in the paper, the alumina was assumed to have $\epsilon_r = 9.8$ and the correction factor for resonator thickness has been ignored for simplicity. The WGH modes in particular correlate very well for the higher radial wavenumbers. The agreement for WGE modes is less conclusive, possibly as there are affected more by the above assumptions. Nevertheless it is clear that it cannot be the fundamental $WG_{n,0,0}$ modes that are being measured as stated. An extended analysis also suggests possible explanations for some of the other unidentified peaks in the response. Using the theoretical frequencies the longitudinal electric field may be plotted versus radius [3] which demonstrates

Manuscript received October 2, 1991.

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IEEE Log Number 9107032.

[1] D. Cros and P. Guillon, *IEEE Trans. Microwave Theory Tech.*, vol. 38, no. 11, pp. 1667–1674, Nov. 1990.