Letters

Comments on "Magnetostatic Waves in a Normally Magnetized Waveguide Structure"

I. V. Vasil'ev

The authors of the above paper[1] made reference to a paper that I wrote with G. S. Makeeva [1] ([3] in the above paper). Some remarks are in order in connection with this.

1) The authors assert that "the case of normally magnetized YIG-slab partially filling a waveguide has never been approached and remains yet unsolved." However, the eigenwaves of an MV guide which consists of two metal parallel screens, two dielectric slabs, and a normally magnetized ferrite slab of finite width without metal walls across the X axis, which is normal to the dc field H_0, was previously investigated by the present author [2], [3]. These guides, together with more complicated structures, were investigated in greater detail in [4]. In all these papers, including the paper in question, the mismatching mode method (the method of partial regions) was applied. This method was applied to the analysis of MW guides for the first time in [1].

2) In view of the above, it seems that the above paper represents a development of the ideas proposed in [1] and the authors should have mentioned this.

3) At the present time there is a more powerful algorithm than the mismatching mode method. This method has been created for the numerical modeling of MW guides with one or more ferrite slabs magnetized by an arbitrarily oriented inhomogeneous field H_0. The analysis of MW guides which retain some metal strips is also possible in this way. The method is based on the finite difference method and makes it possible to analyze dispersion curves and field distributions of MW guide eigenmodes. It is realized in the form of FORTRAN programs for the IBM PC XT/AT [5] [6].

Reply[2] by M. Radmanesh, C.-M. Chu, and G. I. Haddad[3]

We thank the author of the above letter for calling our attention to his research on magnetostatic wave propagation because most of the references he cited, except [1] which we referred to, are not commonly available here. We also would like to make the following statements concerning his comments about our paper:

1) During our investigation of MSW in a rectangular waveguide partially filled with a ferrite, we found that all the available literature dealt with waves guided between parallel conducting plates. This includes the work reported by the author of the above letter [1], which we cited in our paper. (We were not aware of the work reported in [2], but from the description given in the letter, it appears to be also dealing with a parallel-plate structure.) Therefore, we feel that we analyzed a new problem, and our assertion that "the case of normally magnetized YIG-slab partially filling a waveguide has never been approached and remains yet unsolved" is true if we replace "waveguide" with "rectangular waveguide," which was what we really meant.

2) It is obvious that our work may be viewed as an extension of the following problems: (a) a rectangular waveguide completely filled with a ferrite, (b) a parallel-plate guide partially filled with a ferrite slab parallel to the bounding plates (by letting $a \to \infty$), or (c) a parallel-plate guide partially filled with a ferrite slab normal to and in contact with the plates (by letting $b \to \infty$). In our paper, representative works concerning these problems, including [1], are cited. We see no particular reason why we should have mentioned these obvious facts in the text.

3) We are currently attempting to simplify the numerical algorithm used in our alternate approach to the problem using integral equations [7]. However, we are unable to simplify the problem enough to be handled by an IBM PC. We shall be very glad to look into the new approach created by the author of the above letter.

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The author is with the Electron Devices Department, Polytechnical Institute, Polytechnicheskaja, 77, 410016, Saratov, U.S.S.R.

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[1] M. Radmanesh, C.-M. Chu, and G. I. Haddad, *IEEE Trans. Microwave Theory Tech.*, vol. MTT-35, pp. 1226–1230, Dec. 1987.

[2] Manuscript received August 7, 1990.

[3] The authors are with the Department of Electrical and Computer Engineering, University of Michigan, Ann Arbor, MI 48109.

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[7] M. Radmanesh, C.-M. Chu, and G. I. Haddad, "Analysis of magnetic waves in a waveguide using the integral equation method," presented at the IEEE MTT-S Int. Microwave Symp. New York City, June 1988.