Finally, the only possibility to meet a generalized function, i.e., the only case in which (8) fails, is when the tangential component of the perturbed field is not zero on the contour while the unperturbed guide has perfect metallic walls.

Now let us consider the electric analog of (8):

$$i\omega\epsilon\, \mathcal{E}_z + \mathfrak{J}_z = i\omega\epsilon \sum C_k E_{zk}. \tag{12}$$

This expansion will be valid or not accordingly as

$$\nabla_T \cdot (u_z \times \mathcal{H}_T') = \frac{\partial \mathcal{H}_s'}{\partial n} - \frac{\partial \mathcal{H}_n'}{\partial s} \tag{13}$$

contains a Dirac function. This time, neither the separation lines, nor the contour have any effect, since for instance on the contour this is the normal component and not the tangential one which is identically zero with only a step discontinuity. Thus expansion (12) is always valid.

III. Generalization

In the preceding discussion we have assumed that the unperturbed waveguide has perfect metallic walls. In the case of perfect magnetic walls, we must invert our conclusions on expansions (8) and (12): (8) is always valid, while (12) fails when the perturbed transverse magnetic field has a nonzero tangential component on the contour. If in the unperturbed state, the walls have some finite, nonzero surface impedance, none of the sets $\{E_{sk}\}$ or $\{H_{sk}\}$ may be identically zero on the contour, no Dirac function may occur by the above mechanism, and the two expansions are simultaneously valid.

Let us point out that we have assumed the perturbed field has no singularity, which is sufficient for a number of practical cases. However, some perturbations such as dielectric or metallic wedges or metallic strips introduce singularities and are not covered by our theory. For instance, in the case of a microstrip line shielded in a rectangular waveguide, one may attempt to expand the field in terms of normal modes of the rectangular waveguide: then one easily finds that the expansion (12) fails.

IV. Conclusion

In conclusion when the perturbed field has no singularity, expansions (8) and (12) would always be valid unless the perturbed field does not respect some nullity condition imposed on the contour to the transverse tangential electric or magnetic field in the unperturbed waveguide. The possible nullity conditions on axial components would have no importance. Especially the expansions would always be valid in the case of open waveguides which have no contour. Let us recall that we have not rigorously established our proposition; we have only suggested that a suitable extension of the theory of generalized Fourier series might likely make it firmer, but such a purely mathematical work is largely beyond the scope of this letter.

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[8] V. I. Smirnov, *A Course of Higher Mathematics*, vol. 2. New York: Pergamon, 1964. (Actually the generalized Fourier series mentioned in this book ought to be further generalized in order to contain our four-vectors expansions in terms of modes.)

Correction to "Power Deposition in a Spherical Model of Man Exposed to 1–20 MHz Electromagnetic Fields"

JAMES C. LIN

In the above paper,[1] Fig. 5 on page 794 should be as shown here in Fig. 1. An error occurred in translating the tabulated data into graphic form. The corrected figure is consistant with the results shown in Fig. 3 of the above paper.[1]

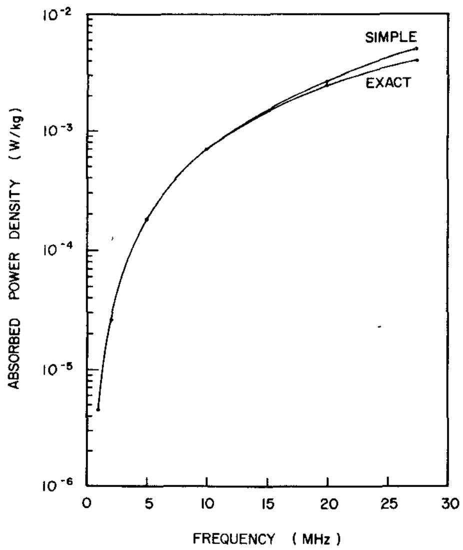

Fig. 1. Maximum absorbed power densities in a man-size sphere given by exact Mie solution and the simplified solution. Incident power density is 1 mW/cm².

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[1] J. C. Lin, A. W. Guy, and C. C. Johnson, *IEEE Trans. Microwave Theory Tech.*, vol. MTT-21, pp. 791–797, Dec. 1973.

Correction to "Variational Solution of Integral Equations"

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In the above paper,[1] two errors have been noted. First, the proof of positive-definiteness of the integral operator on page 239 requires that the potential vanish at infinity. This condition should have been stated just before (19b). By virtue of mirror image symmetries, all the examples presented satisfy this condition.

Difficulties may arise in certain two-dimensional problems because of the logarithmic Green's function. For example, if S is a circle of a radius a and the charge σ is constant:

$$\langle K\sigma, \sigma \rangle \propto -\sigma^2 \ln a.$$

Positive-definiteness holds only for $a < 1$; the form vanishes at a

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[1] B. H. McDonald, M. Friedman, and A. Wexler, *IEEE Trans. Microwave Theory Tech.*, vol. MTT-22, pp. 237–248, Mar. 1974.