Correspondence

Correction to "The Basis of a Theory for the Shielding by Cylindrical Generalized Screens"

Frédéric Broydé and Evelyne Clavelier

In the above paper,[1] several formulas need to be corrected. First, (30) and its associated comments should appear as shown at the bottom of the page, where the integer n and the real propagation "constant" h are separation "constants", a_n and c_n are (h-dependent) amplitude distributions, expressed in V·m^2, b_n and d_n are (h-dependent) amplitude distributions, expressed in A·m^2, η_0 is the free-space wave impedance, k is the wavenumber ω/c_0, and where the functions ϕ_n and ψ_n are defined by the equations stemming from the separation of variables.

Manuscript received April 14, 2002; revised April 26, 2002.

The authors are with Excem, 78580 Maule, France (e-mail: fredbroyde@eu-rexcem.com).

Publisher Item Identifier 10.1109/TEMC.2002.801778.

[1] F. Broydé and E. Clavelier, *IEEE Trans. Electromagn. Compat.*, vol. 42, pp. 414-426, Nov. 2000.

Second, the variables u_n and v_n defined in (33) and (34) should be

$$\begin{cases} u_n \delta(h-k) = a_n \pm \eta_0 b_n i \\ v_n \delta(h-k) = c_n \mp \eta_0 d_n i \end{cases} \tag{33}$$

where δ is the Dirac distribution. The variables u_n and v_n therefore have the dimension of V·m. In this case, we in fact have a TEM wave propagating along the shield axis, and the only nonvanishing field components are

$$\begin{cases} E_r = \mp \dfrac{jkn}{r} e^{\mp jkz} (u_n (r/r_0)^n - v_n (r/r_0)^{-n}) e^{in\theta} \\ E_\theta = \mp \dfrac{jkn}{r} e^{\mp jkz} (u_n (r/r_0)^n + v_n (r/r_0)^{-n}) i e^{in\theta} \\ H_r = \mp \dfrac{1}{\eta_0} E_\theta \\ H_\theta = \pm \dfrac{1}{\eta_0} E_r. \end{cases} \tag{34}$$

Finally, for $h = \pm k$, the boundary conditions given by (36) should be

$$\begin{cases} \forall n \neq 0, \quad (a_n \pm \eta_0 b_n i) + (c_n \mp \eta_0 d_n i) = 0 \\ d_0 = 0. \end{cases} \tag{36}$$

$$\begin{cases} E_r = \displaystyle\int_{-k}^{k} e^{-jhz} \left\{ -jh \sum_{n=0}^{\infty} \left(a_n \frac{\partial \phi_n}{\partial r} + c_n \frac{\partial \psi_n}{\partial r} \right) - j\eta_0 \frac{k}{r} \sum_{n=0}^{\infty} n(b_n \phi_n + d_n \psi_n) i \right\} dh \\ E_\theta = \displaystyle\int_{-k}^{k} e^{-jhz} \left\{ -j \frac{h}{r} \sum_{n=0}^{\infty} n(a_n \phi_n + c_n \psi_n) i + jk\eta_0 \sum_{n=0}^{\infty} \left(b_n \frac{\partial \phi_n}{\partial r} + d_n \frac{\partial \psi_n}{\partial r} \right) \right\} dh \\ E_z = \displaystyle\int_{-k}^{k} e^{-jhz} (k^2 - h^2) \sum_{n=0}^{\infty} (a_n \phi_n + c_n \psi_n) \, dh \\ H_r = \displaystyle\int_{-k}^{k} e^{-jhz} \left\{ j \frac{k}{\eta_0 r} \sum_{n=0}^{\infty} n(a_n \phi_n + c_n \psi_n) i - jh \sum_{n=0}^{\infty} \left(b_n \frac{\partial \phi_n}{\partial r} + d_n \frac{\partial \psi_n}{\partial r} \right) \right\} dh \\ H_\theta = \displaystyle\int_{-k}^{k} e^{-jhz} \left\{ \frac{-jk}{\eta_0} \sum_{n=0}^{\infty} \left(a_n \frac{\partial \phi_n}{\partial r} + c_n \frac{\partial \psi_n}{\partial r} \right) - j \frac{h}{r} \sum_{n=0}^{\infty} n(b_n \phi_n + d_n \psi_n) i \right\} dh \\ H_z = \displaystyle\int_{-k}^{k} e^{-jhz} (k^2 - h^2) \sum_{n=0}^{\infty} (b_n \phi_n + d_n \psi_n) \, dh \end{cases} \tag{30}$$