Corrections to “Lower Bounds on Q for Finite Size Antennas of Arbitrary Shape”

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Equations (24) and (25) in Appendix B of [1] should respectively read as

$$
\int_{V_\infty} - (\nabla G_1) G_2^* e^{jk(r_1-r_2) \cdot \hat{r}} \frac{e^{j(k |r_1| - k |r_2|)}}{16\pi |r|^2} dV = - \frac{r_{12}}{|r_{12}|} \cos(k |r_{12}|) \frac{r_{12}}{|r_{12}|} \frac{1}{8\pi}
$$

and

$$
\int_{V_\infty} j(\nabla G_1) G_2^* e^{jk(r_1-r_2) \cdot \hat{r}} \frac{e^{j(k |r_1| - k |r_2|)}}{16\pi |r|^2} dV = \frac{r_{12}}{|r_{12}|} \cos(k |r_{12}|) \frac{r_{12}}{|r_{12}|} \frac{1}{8\pi}
$$

$$
- \frac{r_{12}}{8\pi k^2} \left( \frac{\sin(k |r_{12}|)}{|r_{12}|^3} - \frac{k \cos(k |r_{12}|)}{|r_{12}|^2} \right)
$$

and

$$
- \frac{r_{12}}{8\pi k^2} \left( \frac{\sin(k |r_{12}|)}{|r_{12}|^3} - \frac{k \cos(k |r_{12}|)}{|r_{12}|^2} \right)
$$

All other results in [1] do not involve the coordinate-dependent terms (those with $r_1 + r_2$ and $|r_1|^2 - |r_2|^2$ multipliers), in which the error actually occurs, and thus, are not affected. The contribution of the coordinate-dependent terms is insignificant for $ka < 0.5$, whereas for larger $ka$, where the contribution gradually increases, the $Q$ itself becomes too low to be reliably related to the bandwidth.

Further numerical results exemplifying and substantiating the general applicability of a procedure for determining the lower bound on $Q$ outlined in Section V in [1] can be found in [2].

The expressions for the stored energies and the radiated power of arbitrary electric and magnetic currents presented in [1] (Tables I and II) can also be used for computing the $Q$ of electrically small antennas loaded with magneto-dielectric materials, as demonstrated in [3] in the context of a surface integral equation method.

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**REFERENCES**

