

Erratum: Electromagnetic scattering by arbitrary-shaped magnetic particles and multipole decomposition: Analytical and numerical approaches [Phys. Rev. B 107, 155425 (2023)]

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In Table I, the magnetic part of the exact electric dipole (ED) and electric quadrupole (EQ) terms should read as

$$\begin{aligned} \mathbf{p}^H &= \frac{ik^2}{\omega\mu_s} \int_{V_p} \frac{j_1(kr)}{kr} [\mathbf{r} \times \mathbf{M}] d\mathbf{r} + \frac{5ik^2}{2\omega\mu_s} \int_{V_p} \frac{j_2(kr)}{(kr)^2} [\mathbf{r} \times \mathbf{M}] d\mathbf{r} - \frac{ik^4}{2\omega\mu_s} \int_{V_p} \frac{j_3(kr)}{(kr)^3} \{r^2[\mathbf{r} \times \mathbf{M}] - 3(\mathbf{r} \cdot [\mathbf{r} \times \mathbf{M}])\mathbf{r}\} d\mathbf{r}, \\ \hat{Q}^H &= \frac{ik^2}{\omega\mu_s} \int_{V_p} \frac{j_2(kr)}{(kr)^2} [3(\mathbf{r}[\mathbf{r} \times \mathbf{M}] + [\mathbf{r} \times \mathbf{M}]\mathbf{r}) - 2(\mathbf{r} \cdot [\mathbf{r} \times \mathbf{M}])\hat{1}] d\mathbf{r} \\ &+ \frac{2ik^2}{\omega\mu_s} \int_{V_p} \frac{j_3(kr)}{(kr)^3} [7(\mathbf{r}[\mathbf{r} \times \mathbf{M}] + [\mathbf{r} \times \mathbf{M}]\mathbf{r}) + 2(\mathbf{r} \cdot [\mathbf{r} \times \mathbf{M}])\hat{1}] d\mathbf{r} \\ &+ \frac{2ik^4}{\omega\mu_s} \int_{V_p} \frac{j_4(kr)}{(kr)^4} [5(\mathbf{r} \cdot [\mathbf{r} \times \mathbf{M}])\mathbf{r}\mathbf{r} - r^2(\mathbf{r}[\mathbf{r} \times \mathbf{M}] + [\mathbf{r} \times \mathbf{M}]\mathbf{r}) - (\mathbf{r} \cdot [\mathbf{r} \times \mathbf{M}])r^2\hat{1}] d\mathbf{r}. \end{aligned}$$

In Table II, the electric part of the LWA electric dipole (ED) and magnetic dipole (MD) terms should read as

$$\begin{aligned} \mathbf{p}^E &\approx \int_{V_p} \mathbf{P} d\mathbf{r} + \frac{k^2}{10} \int_{V_p} [(\mathbf{r} \cdot \mathbf{P})\mathbf{r} - 2r^2\mathbf{P}] d\mathbf{r}, \\ \mathbf{m}^E &\approx -i\omega \frac{1}{2} \int_{V_p} [\mathbf{r} \times \mathbf{P}] d\mathbf{r} + i\omega \frac{k^2}{20} \int_{V_p} r^2 [\mathbf{r} \times \mathbf{P}] d\mathbf{r}. \end{aligned}$$

In Table III, the magnetic part of the discrete representations of the exact ED term should read as

$$\mathbf{p}^H \approx \frac{ik^2}{\omega\mu_s} \sum_{l=1}^N \frac{j_1(kr_l)}{kr_l} [\mathbf{r}_l \times \mathbf{m}_l] + \frac{5ik^2}{2\omega\mu_s} \sum_{l=1}^N \frac{j_2(kr_l)}{(kr_l)^2} [\mathbf{r}_l \times \mathbf{m}_l] - \frac{ik^4}{2\omega\mu_s} \sum_{l=1}^N \frac{j_3(kr_l)}{(kr_l)^3} \{r_l^2 [\mathbf{r}_l \times \mathbf{m}_l] - 3(\mathbf{r}_l \cdot [\mathbf{r}_l \times \mathbf{m}_l])\mathbf{r}_l\}.$$

Equation (A8) should read

$$\int (\mathbf{r}[\nabla\delta(\mathbf{r} - \mathbf{r}_j) \times \mathbf{m}_j] + [\nabla\delta(\mathbf{r} - \mathbf{r}_j) \times \mathbf{m}_j]\mathbf{r}) d\mathbf{r} = \hat{0}.$$

Equation (A10) should read

$$\int (\mathbf{r} \cdot [\nabla\delta(\mathbf{r} - \mathbf{r}_j) \times \mathbf{m}_j]) r^2 d\mathbf{r} = -2(\mathbf{r}_j \cdot [\mathbf{r}_j \times \mathbf{m}_j]).$$

These corrections do not affect any of the physical conclusions, numerical results, or interpretations presented in the original article. The corrections solely concern the explicit forms of several formulas and ensure consistency with the analytical derivations used throughout the work.