Erratum: Dipole resonances of nonabsorbing dielectric nanospheres in the optical range: Approximate explicit conditions for high- and moderate-refractive-index materials [Phys. Rev. A 101, 033841 (2020)]

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In the original version of the paper, there is a mistake in Eqs. (6c) and (6d), which define the Ricatti-Bessel function $\chi_1(x)$ and its first derivative, respectively [1]. The correct equations are as follows:

$$\chi_1(x) = \frac{\cos x}{x} + \sin x, \tag{6c}$$

$$\chi_1'(x) = \cos x - \frac{\cos x}{x^2} - \frac{\sin x}{x}. \tag{6d}$$

This mostly affects the values of $\chi_1(x)$ and $\chi_1'(x)$ for $x \lesssim 1$ and requires some expressions in Sec. III B that are connected to the estimates for fundamental dipole resonances to be consequently modified. In particular,

$$\chi_1'(x)/\chi_1(x) \approx -\frac{12}{(28-7x)}. \tag{17}$$

$$x_{\mathrm{res}(2)}^{a_1,1}(m) = \frac{x_{\mathrm{res}(1)}^{a_1,1}(m) - \frac{7}{3m^2}}{1 - \frac{7}{12m^2}}. \tag{18}$$

$$L_0(m) = -\frac{m^2}{\pi^2}\cos\frac{\pi}{m} - \frac{m}{\pi}\sin\frac{\pi}{m}, \tag{20a}$$

$$L_1(m) = \left(\frac{m^3}{\pi^3}(3-\pi^2) - \frac{m}{\pi}\right)\cos\frac{\pi}{m} + \left(\frac{m^2}{\pi^2}(3-\pi^2)\right)\sin\frac{\pi}{m}, \tag{20b}$$

$$D_0(m) = \left(1 - \frac{m^2}{\pi^2}\right)\cos\frac{\pi}{m} - \frac{m}{\pi}\sin\frac{\pi}{m}, \tag{20c}$$

$$D_1(m) = \left(\frac{3m^3}{\pi^3} - \frac{2m}{\pi}\right)\cos\frac{\pi}{m} + \left(\frac{3m^2}{\pi^2} - 1\right)\sin\frac{\pi}{m}. \tag{20d}$$

$$\Delta x_{\mathrm{res}}^{b_1,1}(m) = -\frac{\pi}{(m^2-1)\left(m + \pi\,\tan\frac{\pi}{m}\right)}. \tag{22}$$

The above-mentioned corrections slightly modify the curves for both sides of Eq. (5) and the right-hand side of Eq. (15) depicted in Fig. 3. This also applies for the numerical values of $x_{\mathrm{res}}^{\square,1}(m)$ and their estimates with subscript (2) that were presented in Fig. 4. With respect to the comparison between them, the maximum percentage error for $x_{\mathrm{res}(2)}^{a_1,1}$ is now found to be 3 instead of 2 as reported in the original version of the paper. The discussion about fundamental dipole antiresonances remains unaltered as well as do curves in Fig. 5.

In contrast, new Eqs. (6c) and (6d) do affect curves for $q_1(x,m)$ and $s_1(x,m)$ in Fig. 6. Nevertheless, the zeros of $q_1^{x\gg1}(x,m)$ and $s_1^{x\gg1}(x,m)$ continue to provide a good approximation to successive electric and magnetic dipole resonances with $j > 1$. However, the "jumps" between adjacent zeroth-order solutions appear for values of m that are higher than those previously presented in Fig. 7. In order to adjust their positions, previous Eq. (34) in Sec. III C should be replaced by

$$m_g^{a_1,j} = \frac{(j+g)}{\left(g+\frac{1}{2}\right)} f_g^{a_1,j}, \tag{34a}$$

with

$$f_g^{a_1,j} = \left[1 + \frac{1}{\pi^2\left(g+\frac{1}{2}\right)^2 - 3}\right]\left[1 - \frac{1}{\pi^2(g+j)^2 - 2}\right], \tag{34b}$$

whereas,

$$m_g^{b_1,j} = \frac{\left(g+j-\frac{1}{2}\right)}{g} f_g^{b_1,j}, \tag{38a}$$

with

$$f_g^{b_1,j} = \left[\frac{\pi^2\left(g+j-\frac{1}{2}\right)^2 - 2}{\pi^2\left(g+j-\frac{1}{2}\right)^2 - 1}\right]\left[\frac{\pi^2 g^2 - 2}{2\pi^2 g^2 - 3 - \sqrt{\pi^4 g^4 - 3}}\right] \tag{38b}$$

should take the place of Eq. (38) in the original version of the paper. Newly defined $m_1^{a_1,j}$ are increased 5% for $g = 1$ and less than 1% for $g > 1$, irrespective of the ordinal number j. For $m_1^{b_1,j}$, such increases are 10% and 2.5%, respectively. The revamped curve fitting of proposed $x_{\mathrm{res}(3)}^{a_1,j}$ and $x_{\mathrm{res}(3)}^{b_1,j}$ to data points keeps the absolute percentage error below 4 all over the considered refractive index range. The free parameter h is confirmed to be negatively proportional to j and directly proportional to g as previously reported.

Corrected versions of $\chi_1(x)$ and $\chi_1'(x)$ also modify contour and scatter plots in Fig. 9 as well as solid curves and dashed lines in Fig. 10. However, the changes in the values of calculated dipole resonances and antiresonances and those of their estimates are exactly the same and do not affect the conclusion of the original paper about the validity of obtained expressions even for weakly absorbing dielectric media, such as Si, CuO_2, or TiO_2.

For the sake of readability, a new version of the paper with fully corrected equations, text, and figures has been made available in Ref. [2].

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[1] M. Kerker, *The Scattering of Light and Other Electromagnetic Radiation* (Academic, New York, 1969).
[2] F. López-Tejeira, arXiv:1910.14345 [physics.optics].