Erratum: "Some consequences of experiments with a plasmonic quantum eraser for plasmon tomography" [J. Appl. Phys. 109, 023101 (2011)]

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This article was originally published with an error in formula (9). We apologize for this. The correct expression for $B_T(x,z,t)$ is the following:

$$B_T(x,z,t) = B_o\sqrt{\sin^2(kx-\omega t)+\sin^2(kz-\omega t)}. \quad (9)$$

This error does not affect the conclusions. Appendix A, all figures, and everything before formula (9) remain unchanged. Since formulas (10), (11) and (14), (15) are derived from Eq. (9), they should be disregarded. The more important consequence of Eq. (9) is that, in contrast to $E_y(x,z,t)$, $B_T(x,z,t)$ does not have nodes. In spite of this, the comments in Sec. IV about the photon propagation are correct. In order to make this point clear, we have included here Fig. 5. Using expressions (4) and (9), the instantaneous values of the magnitudes of $E_y(x,z,t)$ and $B_T(x,z,t)$ in the beams' crossing region are shown in Fig. 5. The brightest spots occur at the regions where $|E_y| \neq 0$ and $|B_T| \neq 0$, i.e., at the zones occupied by the bright fringes of the interference pattern shown in Fig. 4. The darkest spots appear at the regions where $|E_y| = 0$ and $|B_T| = 0$. The gray zones occur where $|E_y| = 0$ but $|B_T| \neq 0$. The arrows in Fig. 5 correspond to the calculated Poynting vector. These arrows indicate the direction of the electromagnetic energy flow. The small white circles were included in Fig. 5 to illustrate how one [Fig. 5(a)] or many [Fig. 5(b)] photons could pass through the interference pattern. It is worth noting that photons passing through the interference pattern (1) do not change their original direction of propagation, which is different from the direction of the electromagnetic energy flow, (2) never traverse any dark spot where $|E_y|$ and $|B_T|$ are simultaneously zero, and (3) can only be detected by a conventional photodetector while passing over a bright spot.

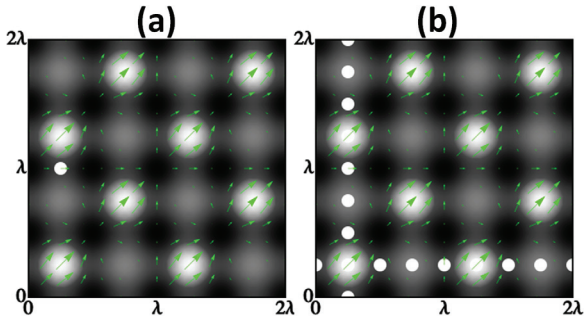

FIG. 5. (Color online) Calculated values of the instantaneous magnitude of the electric and magnetic fields in the beams crossing region. The brightest, darkest, and gray zones correspond to regions where $|E_y| \neq 0$ and $|B_T| \neq 0$, $|E_y| = |B_T| = 0$, and $|E_y| = 0$ but $|B_T| \neq 0$, respectively. The brightest (gray) spots occur in the regions occupied by the bright (dark) interference fringes shown in Fig. 4. The arrows correspond to the calculated values of the Poynting vector. The small white circles represent photons (enhanced online) [URL: http://dx.doi.org/10.1063/1.3594740].

In Appendix B, everything before formula (B9) remains unchanged. Formula (B9) should be changed to

$$B_T(x,z,t) = \sqrt{B_x^2(z,t)+B_z^2(x,t)}. \quad (B9)$$

In addition, everything after formula (B9) should be modified in the following way: "Finally, Eq. (9) follows from Eqs. (B3), (B7), and (B9)."

