Linearly polarized second harmonic generation microscopy reveals chirality: erratum

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Abstract: An erratum is presented to clarify both the direction of light polarization in our experiments and the unit cell geometry of the samples. Additionally, the spectral dependence of the second harmonic generation response in the G-shaped nanostructures made of gold is corrected. These changes do not affect our previous conclusions.

OCIS codes: (180.4315) Nonlinear microscopy; (240.4350) Nonlinear optics at surfaces; (160.1585) Chiral media; (160.3918) Metamaterials.

References and links

1. V. K. Valev, A. V. Silhanek, N. Smisdom, B. De Clercq, W. Gillijns, O. A. Aktsipetrov, M. Ameloot, V. V. Moshchalkov, and T. Verbiest, "Linearly polarized second harmonic generation microscopy reveals chirality," Opt. Express **18**(8), 8286–8293 (2010).
2. V. K. Valev, A. V. Silhanek, N. Verellen, W. Gillijns, P. Van Dorpe, O. A. Aktsipetrov, G. A. E. Vandenbosch, V. V. Moshchalkov, and T. Verbiest, "Asymmetric optical second-harmonic generation from chiral G-shaped gold nanostructures," Phys. Rev. Lett. **104**(12), 127401 (2010).
3. V. K. Valev, X. Zheng, C. G. Biris, A. V. Silhanek, V. Volskiy, B. De Clercq, O. A. Aktsipetrov, M. Ameloot, N. C. Panoiu, G. A. E. Vandenbosch, and V. V. Moshchalkov, "The origin of second harmonic generation hotspots in chiral optical metamaterials," Opt. Mater. Express **1**(1), 36–45 (2011).

In the article [1], for all figures, the direction of light polarization should be rotated 90°. Furthermore, in Figs. 1 and 3, the geometry of the sample arrays should be replaced as follows:

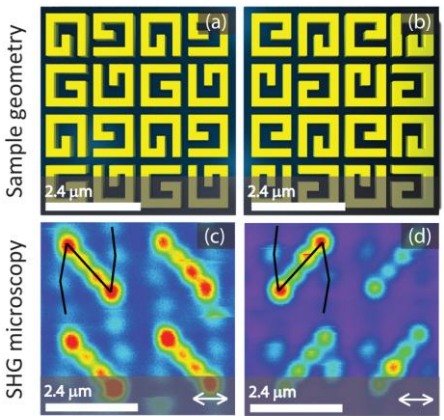

Fig. 1. Schematic diagram of the sample geometry of the G-shaped and of the mirror-G shaped sample structures, in (a) and (b) respectively. In (c) and (d), the SHG microscopy images of the G-shaped and of the mirror-G shaped sample structures respectively. The white arrows indicate the direction of the linear polarization. The color coded intensities increase from purple, through green, then yellow to red.

#146328 - $15.00 USD Received 20 Apr 2011; published 26 Apr 2011

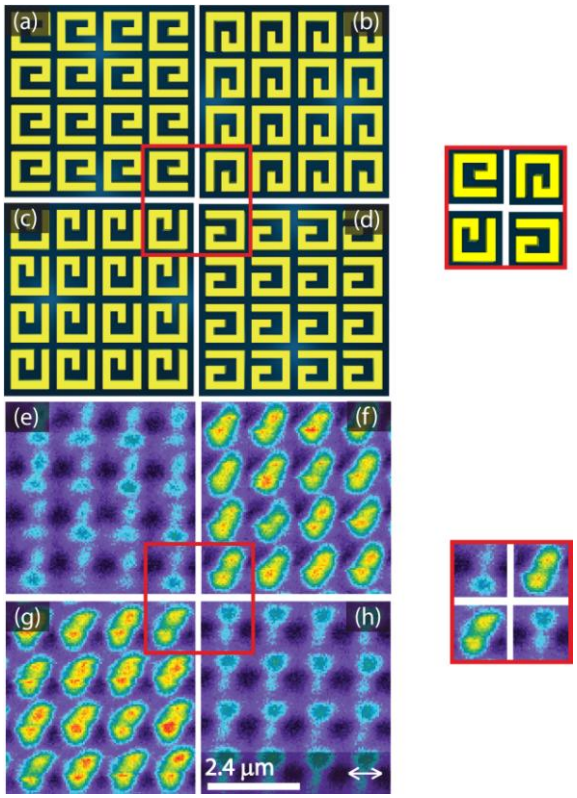

Fig. 3. In (a), (b), (c) and (d), schematic diagram of the sample geometry of the mirror-G shaped sample structures rotated in steps of 90°. In (e), (f), (g) and (h), the corresponding SHG microscopy images. The color coded intensities increase from purple, through green, then yellow to red. The red squares emphasize the pattern reproducing the mirror-G unit cell in Fig. 1. The white arrows indicate the direction of the linear polarization, which is identical for all images shown.

Moreover, in Fig. 4, we presented data demonstrating that the second harmonic generation hotspots most likely originate in surface plasmon resonance field enhancement of the nanostructures. Our data suggested the presence of a very sharp resonance near 800 nm and we concluded that the second harmonic light is generated from the regions of high charge accumulation. Here we present a corrected Fig. 4, where the intensity of the hotspots diminishes over a much larger wavelength range. Although, the plasmon resonance is not as sharp as initially believed, it is in good agreement with the reflection spectra reported in Fig. 1(c) of [2]. Henceforth, the present correction to Fig. 4 does not significantly affect our previous conclusions. Especially, our conclusion that the second harmonic light is generated from the regions of high charge accumulation is strongly reinforced by [3].

#146328 - $15.00 USD Received 20 Apr 2011; published 26 Apr 2011

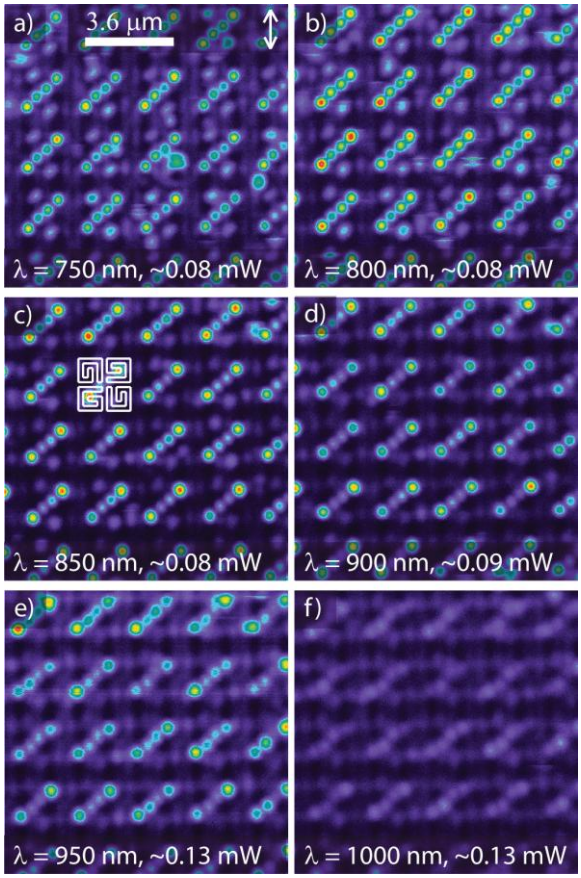

Fig. 4. In (a) to (f) SHG microscopy images of the G-shaped sample structures as function of increasing fundamental wavelength from 750 nm to 1000 nm in steps of 50 nm. The color coded intensities increase from purple, through green, then yellow to red. The white arrows indicate the direction of the linear polarization. In (c), a unit cell is superimposed on the pattern to illustrate the location of the hotpots. The laser powers were measured on the microscope stage, upon focusing with the objective.

#146328 - $15.00 USD Received 20 Apr 2011; published 26 Apr 2011