

Received 25 September 2020

Accepted 13 November 2020

Edited by G. Grübel, HASYLAB at DESY, Germany

Keywords: X-ray free-electron laser; intensity correlation; X-ray fluorescence

Determination of X-ray pulse duration via intensity correlation measurement of X-ray fluorescence.

Erratum

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Corrections to equations and experimental results in the paper by Inoue *et al.* [(2019). *J. Synchrotron Rad.* **26**, 2050–2054] are made.

The correct versions of equations (2) and (3) in the paper by Inoue *et al.* (2019) are as follows:

$$g_f^{(2)}(r_1, r_2) = 1 + \frac{1}{2} |j(r_1, r_2)|^2 \int \Pi(\tau) |\gamma(\tau)|^2 d\tau, \quad (2)$$

$$g_f^{(2)}(r_1, r_2) = 1 + \frac{1}{2} g_0^{(2)} \exp\left(-\frac{\Delta x^2}{2l_x^2}\right) \exp\left(-\frac{\Delta y^2}{2l_y^2}\right). \quad (3)$$

The additional factors of 1/2 on the right-hand sides of these equations represent a decrease in intensity correlation of X-ray fluorescence due to the unpolarized nature of the fluorescence (Trost *et al.*, 2020; Goodman, 2007).

Accordingly, the degree of intensity correlation [$g_0^{(2)}$] and the XFEL duration [$2\sqrt{2\ln 2}\sigma_t$] evaluated by the experiment also need to be corrected; the values of $g_0^{(2)}$ and $2\sqrt{2\ln 2}\sigma_t$ shown in Section 4 should be 0.0262 ± 0.008 and 5.1 ± 0.2 fs, respectively. The determined XFEL duration is consistent with previous estimations by other methods (Inubushi *et al.*, 2017; Inoue *et al.*, 2018), in which the XFEL duration was evaluated to be less than 10 fs. Although the determined XFEL duration is shorter than the electron bunch duration measured by a radiofrequency deflector (~ 10 fs in FWHM), such discrepancy could be explained by insufficient time resolution of the deflector (~ 10 fs) (Ego *et al.*, 2015).

Acknowledgements

We thank the authors of Trost *et al.* (2020) for pointing out the errors in the original paper.

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