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# 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  $0.0262 \pm 0.008$  and  $5.1 \pm 0.2$  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 ( $\sim 10$  fs in FWHM), such discrepancy could be explained by insufficient time resolution of the deflector ( $\sim 10$  fs) (Ego *et al.*, 2015).

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