Erratum: Time-Resolved Phase Measurement of a Self-Amplified Free-Electron Laser [Phys. Rev. Lett. 89, 234801 (2002)]

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Unfortunately, some of the equations in the Letter have errors. The correct form of Eq. (1) is

$$E(t,z) = E_0(z)\sum_{j=i}^{N_e}\exp\left[i\omega_r(t-t_j) - \frac{(t-t_j-z/v_g)^2}{4\sigma_t^2}\left(1-\frac{i}{\sqrt{3}}\right)\right]. \tag{1}$$

A recent thorough analysis [1] shows that, with the electron beam energy chirp included, the correct form of Eq. (3) is

$$E(t,z) = E_0(z)\sum_{j=i}^{N_e}\exp\left\{i\left[\omega_j + \Phi''_\gamma\left(t-t_j-\frac{z}{\nu_p}\right)\right]\left(t-t_j-\frac{z}{c}\right) - \frac{1}{4\sigma_t^2}\left(t-t_j-\frac{z}{\nu_g}\right)^2\left(1-\frac{i}{\sqrt{3}}\right)\right\}, \tag{3}$$

where $\omega_j = \omega_0 + 2\Phi''_\gamma(t_j - t_0)$, and $\nu_p = c/(1 + \lambda_0/\lambda_u)$. The unnumbered equation on p. 3 should be

$$\Gamma_0 = \frac{1}{4\sigma_t^2} - i\left(\Phi''_\gamma + \frac{1}{4\sqrt{3}\sigma_t^2}\right).$$

Three lines below this equation, the pulse form factor conversion equation should be $1/\Gamma = 1/\Gamma_0 + i\Phi''_m$. The correct form for Eq. (4) is

$$\phi'' = \frac{d^2\phi}{dt^2} = -2\mathrm{Im}(\Gamma) = 2\frac{\Omega\Theta + \Phi''_m}{\Omega^2 + \Phi''^2_m}. \tag{4}$$

Just below Eq. (4), the definition of Ω should be $\Omega = 4\sigma_t^2 + \Theta\Phi''_m$ with $\Theta = 1/\sqrt{3} + 4\sigma_t^2\Phi''_\gamma$. As the result of this, curves in Fig. 3 are vertically shifted (see the new Fig. 3).

The motivation, discussion, and conclusions presented in the Letter are entirely unaffected by these errors.

[1] S. Krinsky and Z. Huang, Phys. Rev. ST Accel. Beams **6**, 050702 (2003).

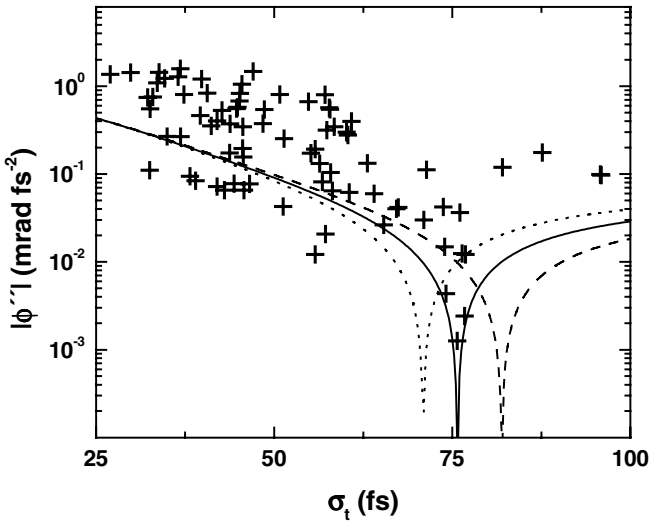

FIG. 3. Magnitude of the chirp of the SASE spikes. The data points are experimental measurement using the FROG. The curves are fit using Eq. (4) with an electron bunch chirp of $-24\ \mathrm{m}^{-1}$ (dashed line), $-28\ \mathrm{m}^{-1}$ (solid line), and $-33\ \mathrm{m}^{-1}$ (dotted line).

