Erratum: Optical properties of shock-compressed diamond up to 550 GPa [Phys. Rev. B 101, 184106 (2020)]

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For shots at pressures lower than the Hugoniot elastic limit (HEL), the attenuation coefficient behind the elastic shock front, α_e, was calculated by measuring the signal counts before and after the elastic wave propagates a distance of $x_e = 10$ μm. As the signal counts were time resolved by velocity interferometer systems for any reflector (VISAR), the time duration t_e corresponding to the time of the shock wave velocity D_e to travel x_e is needed to obtain α_e. In the original paper, we determined the time duration by $t_e = x_e/D_e$, but this is incorrect as it neglects the motion of the interface between the aluminum and diamond which moves with the true particle velocity U_e. The correct equation should be $t_e = x_e/(D_e - U_e)$ [1,2]. For the same reason, the time duration for the plastic shock wave propagation x_p should be corrected as $t_p = x_p/(D_p - U_p)$, where D_p and U_p are the shock and particle wave velocities of the plastic state, respectively.

In Eq. (2), $\alpha_e = 15(\pm 1)\,\text{cm}^{-1}$ was used as a constant value for the attenuation coefficient of the elastically compressed volume at the HEL condition. Applying the above correction of the relationship between t_e and x_e results in a new constant value of $\alpha_e = 16(\pm 1)\,\text{cm}^{-1}$. With these corrections, we reevaluated the pressure dependence of the attenuation coefficients of shocked single-crystal diamond ⟨100⟩ (Fig. 4) as shown below.

We note that the above corrections have no qualitative effect on the conclusions of the original paper.

We thank M. Millot for pointing out this issue.

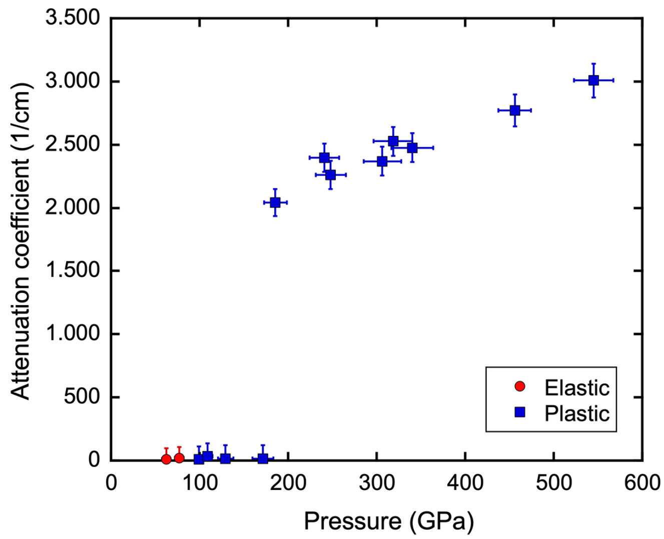

FIG. 4. Updated figure showing the pressure dependence of the attenuation coefficient at 532 nm for single crystal diamond shocked along ⟨100⟩. The red and blue symbols denote the elastic and plastic regions, respectively.

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