Erratum: Dynamical Orbital Angular Momentum Induced by Circularly Polarized Phonons [Phys. Rev. Lett. 137, 066301 (2026)]

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In this Erratum, we correct the errors in our model calculation of the transition-metal-dichalcogenide (TMD) materials. The geometric OAM in Eq. (3) of our Letter is rewritten as

$$L_z = \hbar\omega \sum_n^{\mathrm{occ}} \sum_m^{\mathrm{unocc}} \left[\frac{\langle n|\hat{L}_z|m\rangle\langle m|i\partial_\tau|n\rangle}{E_n - E_m} + \mathrm{c.c.} \right], \tag{1}$$

where $|n\rangle$ and $|m\rangle$ represent the wave functions of the occupied and unoccupied states, respectively, and we rewrite the Berry connection $\langle m|i\partial_\tau|n\rangle = \langle m|i\partial_\tau \mathcal{H}_{\mathrm{eff}}|n\rangle/(E_n - E_m)$. After reexamining our original calculation, we find errors in the expressions for $\bar{L}_z(q)$ in Eq. (9) and L_z^{tot} of our Letter. Here we correct the calculation as follows. The four orthonormal eigenstates of the effective Hamiltonian in Eq. (8) in our Letter read

$$|1\rangle = \frac{1}{\sqrt{2\varepsilon(\varepsilon - \Delta)}} [-i(\varepsilon - \Delta)e^{i\tau}, -i\tilde{v}\xi^\dagger e^{i\tau}, 0, -\tilde{\lambda}_u]^{\mathsf{T}}, \tag{2}$$

$$|2\rangle = \frac{1}{\sqrt{2\varepsilon(\varepsilon - \Delta)}} [0, i\tilde{\lambda}_u e^{i\tau}, \varepsilon - \Delta, -\tilde{v}\xi]^{\mathsf{T}}, \tag{3}$$

$$|3\rangle = \frac{1}{\sqrt{2\varepsilon(\varepsilon + \Delta)}} [i(\varepsilon + \Delta)e^{i\tau}, -i\tilde{v}\xi^\dagger e^{i\tau}, 0, -\tilde{\lambda}_u]^{\mathsf{T}}, \tag{4}$$

$$|4\rangle = \frac{1}{\sqrt{2\varepsilon(\varepsilon + \Delta)}} [0, i\tilde{\lambda}_u e^{i\tau}, -(\varepsilon + \Delta), -\tilde{v}\xi]^{\mathsf{T}}, \tag{5}$$

where $\varepsilon = \sqrt{\tilde{v}^2 q^2 + \Delta^2 + \tilde{\lambda}_u^2}$. Therefore, the OAM reads

$$\bar{L}_z = \frac{\hbar\omega}{4\varepsilon^2} \sum_{n=1}^{2} \sum_{m=3}^{4} [\langle n|\hat{L}_z|m\rangle\langle m|i\partial_\tau \mathcal{H}|n\rangle + \mathrm{c.c.}] \tag{6}$$

with $\hat{L}_z = \mathrm{diag}(2\hbar, 0, -2\hbar, 0)$. Using the eigenstates in Eqs. (2)–(5), the momentum-dependent OAM is given by

$$\bar{L}_z(q) = \frac{\tilde{\lambda}_u^2 \hbar^2 \omega}{(\tilde{v}^2 q^2 + \Delta^2 + \tilde{\lambda}_u^2)^{\frac{3}{2}}}, \tag{7}$$

which replaces the result in Eq. (9) in our Letter. The total OAM is obtained by integrating $\bar{L}_z(q)$ over the wave numbers q_x and q_y. Extending the integration region to infinity and including the factor $(2\pi)^{-2}$ which was omitted in our original calculation, we obtain

$$L_z^{\mathrm{tot}} = \int \frac{dq_x dq_y}{(2\pi)^2} \bar{L}_z(q) = \frac{\hbar^2 \omega}{2\pi\tilde{v}^2} \frac{\tilde{\lambda}_u^2}{\sqrt{\Delta^2 + \tilde{\lambda}_u^2}}. \tag{8}$$

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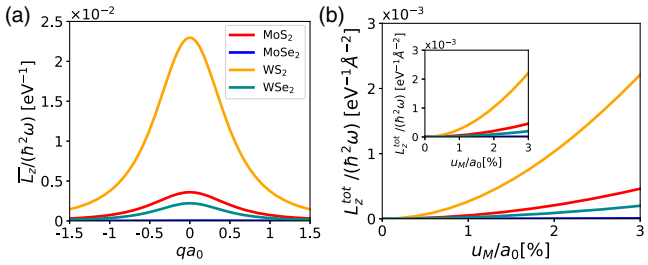


FIG. 1. Electronic OAM induced by the phonon at K point with $l_{\mathrm{ph}} = 1$ in monolayer TMDs MoS_2, $MoSe_2$, WS_2, and WSe_2. (a) OAM as a function of wave number q with $u_{\mathrm{M}}/a_0 = 1\%$. (b) Total OAM as a function of u_{M}/a_0.

The momentum-dependent OAM $\bar{L}_z(q)$ shows an inverse-cubic gap dependence. After integration over the momentum space, the total OAM L_z^{tot} exhibits a $|\Delta|^{-1}$ dependence.

In conclusion, $\bar{L}_z(q)$ and L_z^{tot} in our Letter are replaced by Eqs. (7) and (8), respectively. Accordingly, the derivations in Eqs. (S74)–(S77) of the Supplemental Material are replaced by those presented in Eqs. (2)–(8) above. Figures 4(b) and 4(c) in our Letter are replaced by Figs. 1(a) and 1(b), respectively. The estimations of the electron OAM in the unit of $\hbar(\mu_{\mathrm{B}})$ listed in Table II in our Letter are corrected in Table I. The induced OAM (magnetic moment) reaching the order of $10^{-4}\hbar$ $(10^{-4}\mu_B)$ remains unchanged.

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TABLE I. Electron OAM per unit cell in the unit of $\hbar$. We assume that the displacement of atom M is 1% of the bond length a_0, and the phonon energy is $\hbar\omega = 0.02$ eV. The corresponding electron orbital magnetic moment has the same value in the unit of μ_{B}.

	MoS_2	$MoSe_2$	WS_2	WSe_2
Published	6.8×10^{-6}	1.4×10^{-8}	1.8×10^{-4}	2.0×10^{-6}
Corrections	1.6×10^{-5}	2.0×10^{-7}	8.1×10^{-5}	7.8×10^{-6}