Erratum: Spin-Orbit Coupling, Quantum Dots, and Qubits in Monolayer Transition Metal Dichalcogenides [Phys. Rev. X **4, 011034 (2014)]**

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In our paper, there are misprints in Table II regarding the values of g_{vl} and $\tilde{g}_{vl}$ that need to be corrected. In addition, we have decided that in order to adhere to the standard definitions used in the literature regarding Hamiltonians that involve g factor(s), a minor change is appropriate. We redefine $\tilde{g}_{vl}$ in Eq. (2): $\tilde{g}_{vl} \rightarrow -\tilde{g}_{vl}$, and therefore Eq. (2) should read

$$\tilde{H}_{el}^{\tau,s} + \tilde{H}_{vl}^{\tau} + \tilde{H}_{sp}^s = \frac{\hbar^2 \hat{q}_+ \hat{q}_-}{2m_{\text{eff}}^{\tau,s}} + \frac{1+\tau}{2} \text{sgn}(B_z) \hbar \omega_c^{\tau,s} + \frac{\tau}{2} \tilde{g}_{vl} \mu_B B_z + \frac{1}{2} \mu_B g_{so}^{\perp} s_z B_z,$$

where $\hbar \omega_c^{\tau,s} = e|B_z|/m_{\text{eff}}^{\tau,s}$. Accordingly, the second sentence below Eq. (2) should read as follows: “The next term $\tilde{H}_{vl}^{\tau} = \frac{\tau}{2} \tilde{g}_{vl} \mu_B B_z$ breaks the valley symmetry of Landau levels.”

The $\tilde{g}_{vl}$ values shown in the first row of Table II of the manuscript need to be corrected because they are actually half of the correct values. In addition, a minus-sign change comes from the above-mentioned redefinition of $\tilde{g}_{vl}$. Furthermore, since g_{vl} in Eq. (4) is defined through $\tilde{g}_{vl}$, both its definition and its values (shown in the third row of Table II) are also modified. After redefinition, g_{vl} is given by $g_{vl} = (2m_e/m_{\text{eff}}^0) + \tilde{g}_{vl}$. The new Table II of the manuscript, with the corrected values of the valley g factors $\tilde{g}_{vl}$ and g_{vl} , is shown below. Note that the spin g factors $g_{so}^{\perp}$ and $g_{sp}^{\perp}$ do not need to be changed.

Some of the g_{vl} values also appear in the captions of Figs. 5 and 6, which therefore also need to be corrected.

The caption of Fig. 5 should read as follows.

“Spectrum of a 40-nm WS₂ quantum dot as a function of the perpendicular magnetic field $B_z > 0$. Black (red) lines show the spin $\uparrow$ ($\downarrow$) states from the valley K (K'). The values of $m_{\text{eff}}^{\tau,s}$ can be found in Table I, whereas $g_{vl} = -3.36$ and $g_{sp}^{\perp} = 1.99$ (see Table II).”

TABLE II. Valley ($\tilde{g}_{vl}$, g_{vl}) and spin ($g_{so}^{\perp}$, $g_{sp}^{\perp}$) g factors for different transition metal dichalcogenides.

	MoS ₂	WS ₂	MoSe ₂	WSe ₂
$\tilde{g}_{vl}$	-7.14	-9.92	-6.06	-8.68
$ g_{so}^{\perp} $	0.21	0.84	0.29	0.87
g_{vl}	-2.83	-3.36	-2.71	-2.85
$g_{sp}^{\perp}$	1.98	1.99	2.07	2.04

Similarly, the caption of Fig. 6 needs to be modified, and it should read as follows.

“Spectrum of a 40-nm WS₂ quantum dot as a function of the perpendicular magnetic field $B_z > 0$. The values of $m_{\text{eff}}^{\tau,s}$ can be found in Table I, and we use $g_{vl} = -1.94$ and $g_{sp}^{\perp} = 1.84$ (see Fig. 5). Black (red) lines show spin $\uparrow$ ($\downarrow$) states from the K (K') valley.”

Finally, the sentence before Eq. (B7) and the definition of $\tilde{g}_{vl}$ should read as follows.

“The zeroth-order term yields the valley-splitting Hamiltonian $\tilde{H}_{vl}^{\tau} = \frac{\tau}{2} \tilde{g}_{vl} \mu_B B_z$, with

$$\tilde{g}_{vl} = -2(1 + 4m_e |\tilde{\gamma}_3|^2 / E_{bg}).”$$

We emphasize that the numerical calculations for quantum dots shown in Figs. 4–6 are not affected by these changes. All conclusions of the paper remain unchanged.

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